HYPERSONIC HYPE: AN ANALYSIS OF THE EMERGING SINO-AMERICAN ARMS RACE IN THE PACIFIC

by

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The 21st century has seen the economic rise of China and the resultant increase in the influence of Chinese leaders on international affairs. The transformation of China into a global superpower in the past two decades has some American officials calling for drastic increases in American military spending to develop new warfighting capabilities against what they see as an emerging threat from an emboldened China. The resultant emerging arms race in what the United States has dubbed a "New Era of Great Power Competition" I argue is counterproductive to the vital security interests of both countries and is—most importantly—not inevitable.

The fundamental issues at stake in the emerging arms race are the American pursuit of a national ballistic missile defense system and the reactionary Chinese development of hypersonic and MIRV technologies to counter any potential American advances in ballistic missile defense. Both countries would be better served by ratcheting down arms development as I prove using established political theory and the claims of top American military and political officials.

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Is an Arms Race with China Inevitable?

"There are people who wish I wouldn't refer to China as our enemy. But that's exactly what they are."[1] These words were uttered in November 2015 by American presidential candidate, Donald J. Trump. After Trump's election to America's highest office, top scholars spoke out against this sort of threat inflation.[2] Is China really a threat to the United States? Where is the source of this disagreement between the administration and academic professionals?

Under the past three administrations, the American government has been increasingly using the threat of a rising China to justify massive military budgets and investments into new warfighting technologies—particularly missile defense and nuclear arsenal modernization. Concerns about China's annual increases in military spending are in large part fueling the narrative that America needs to build up its military to combat the erosion of its global hegemony. The Trump Administration made its position clear when it used the 2018 Nuclear Posture Review to explicitly state that American nuclear

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[1] ""Journalist: As U.S. Retreats from World Stage, China Moves To Fill The Void," NPR (NPR, January 3, 2018), https://www.npr.org/2018/01/03/575288560/journalist-as-u-s-retreats-from-world-stage-china-moves-to-fill-the-void)

[2] J. Stapleton Roy M. Taylor Fravel, "Opinion | China Is Not an Enemy," The Washington Post (WP Company, July 3, 2019), https://www.washingtonpost.com/opinions/making-china-a-us-enemy-is-counterproductive/2019/07/02/647d49d0-9bfa-11e9-b27f-ed2942f73d70_story.html)

strategy will now be focused on a new era of “Great Power Competition,” alluding to what it views as hostile actions by both Chinese and Russian actors.[3]

Chinese military spending is increasing, yes, but so is the size of the Chinese economy. Some experts say China’s increased military expenditures and investments in new technologies warrant an American defense buildup in response. Others disagree, claiming many of the military measures the United States is taking to counter China’s rise are serving to diminish rather than bolster American security. Two key sticking points are the development of an American national missile defense system and the advent of new Chinese nuclear delivery platforms like MIRVs (multiple independently targeted reentry vehicles) and hypersonic weapons. Those in favor of an American national missile defense system argue that such a system is justified to protect American cities from a limited attack by Chinese ICBMs (intercontinental ballistic missiles) while those against the development of such a system claim that missile defense forces adversaries to build up arms to ensure they can overcome the defense.

This paper will prove that a strategic arms race with China is not inevitable, and both nations would be better off devoting resources to other more pressing matters such as nuclear non-proliferation and counterterrorism operations. This report will prove that the Chinese military currently does not—and does not intend—to pose an existential threat to the nuclear strategic security of the United States. None of the nuclear delivery technologies China is developing are intended for warfighting, and the number of

[3] United States. 2018. *Nuclear Posture Review report*. Washington, DC: U.S. Dept. of Defense. Pg 6.

nuclear arms Beijing would need to contemplate a first strike on the continental United States would be extremely costly and time consuming for the Chinese government to achieve.

Where is there Disagreement?

Much has been written on the rise of China by American scholars, journalists, think tanks, pundits, military planners, and politicians in recent years. China's rapidly growing economic and military power has many American officials fearful of a future international system where the United States lacks much of the relative power and influence it enjoyed in the post-Cold War unipolar era. According to American political scientist Fareed Zakaria (writing in February 2020), "sometime in the last two years, American hegemony died."[4] Following the conclusion of the Cold War and in the absence of the Soviet Union to compete with for international spheres of influence, the United States was left to pursue a new world order, exerting unchallenged influence around the world as the sole remaining superpower. Throughout the past three unipolar decades, the United States was able to operate internationally relatively unchecked. Both allies and adversaries were chiefly subject to the international policy concerns of the United States. Washington was able to build broad multinational coalitions to fight in the Middle East and bring former Soviet states into NATO.

In the past few years, Zakaria argues American hegemony has eroded as the country has retreated from the global stage.[5] In this era of waning relative influence of

[4] Fareed Zakaria, "The Self-Destruction of American Power," Foreign Affairs, December 31, 2019, www.foreignaffairs.com/articles/2019-06-11/self-destruction-american-power)
[5] Ibid.

American power we will examine the perspectives of those who agree the United States should bolster its nuclear arms and missile defenses in response to China's own increased military capability, and those who disagree and argue the United States should refrain from a military buildup that could lead to a spiraling unnecessary arms race.

Arguments Against American Ballistic Missile Defense and Nuclear Modernization

American missile defense efforts lead to a classic playing out of "the security dilemma."[6] Under Robert Jervis's concept, when the United States seeks heightened security through missile defense, China's security will be threatened. This provokes a response from the threatened state, which can in turn be seen by the first state as a justification for its defensive investments, leading to an intensifying arms race.[7]

Kenneth N. Waltz, the father of structural realism, argued that the diffusion of nuclear weapons could be better for worldwide stability. As a pillar of structural realism, Waltz claims "states must help themselves by providing for their own security."[8] This logic justifies the Chinese government's initial nuclear test in 1964 and

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[6] Jervis, Robert. "Cooperation Under the Security Dilemma." World Politics 30, no. 2 (1978): 167-214. Accessed May 18, 2020. www.jstor.org/stable/2009958.

[7] Eugene Gholz, Benjamin Friedman & Enea Gjoza (2019) Defensive Defense:
A Better Way to Protect US Allies in Asia, The Washington Quarterly, 42:4, 171-189, DOI: 10.1080/0163660X.2019.1693103

[8] Sagan, Scott Douglas., and Kenneth Neal Waltz. *The Spread of Nuclear Weapons: an Enduring Debate: with New Chapters on Iran, Iraq, and North Korea, and on the Prospects for Global Nuclear Disarmament*. Thirded. New York, NY: Norton, 2013. Pg. 5.

pursuit of a subsequent extended nuclear program.[9] While China's nuclear arsenal was initially developed to deter the much stronger neighboring Soviet Union from attack, the fact that each was a nuclear power caused them to deal carefully with each other for the duration of the Cold War. Waltz argues nuclear weapons were the key to regional stability between Moscow and Beijing. He asserts, "Nuclear weapons caused China and the Soviet Union to deal cautiously with each other."[10] Even as soon as China had tested a singular nuclear weapon the Soviet Union had to consider that any aggressive action they took against their Chinese neighbors could potentially escalate to nuclear war. Even though Beijing's nuclear arsenal was at the time (and still remains) much smaller than Moscow's, the chance of incurring a retaliatory nuclear strike was enough to prevent Moscow from any substantial aggressive action—conventional or nuclear—on Chinese soil.

While initial Chinese missile technology focused on deterring a Soviet first strike with intermediate-range ballistic missiles (IRBMs), latter ICBM development would eventually ensure Chinese leaders' capability to deter the United States as well. It was rational for Chinese leaders to develop the capability to deter an ideologically opposed superpower in 1981 when the People's Liberation Army's DF-5 ICBM was

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[9] Declaration of the Government of the People's Republic of China" *Renmin Ribao*, 16 October 1964, via: http://news.xinhuanet.com.

[10] Sagan, Scott Douglas., and Kenneth Neal Waltz. *The Spread of Nuclear Weapons: an Enduring Debate: with New Chapters on Iran, Iraq, and North Korea, and on the Prospects for Global Nuclear Disarmament*. Thirded. New York, NY: Norton, 2013. Pg. 12.

first operational, and it remains rational for the PLA to maintain that capability in 2020.[11]

Applying Waltz's theory to the current Sino-American arms race, we can see how the American withdrawal from the Anti-Ballistic Missile (ABM) Treaty in 2002 could create a rational incentive for the Chinese government to act to ensure their nuclear deterrent remained potent in the face of potential future American missile defense advances. China's reasoning for pursuing upgraded nuclear technologies may be further explained by Waltz's position that perhaps the only technological advancement that could alter the fundamental principles behind effective strategic deterrence is a "ballistic missile defense breakthrough."[12] Effectively, by augmenting their deterrent with MIRV and hypersonic capabilities the Chinese military is hedging their national security by ensuring that even if American leaders are so misguided as to believe their ballistic missile defense could protect the continental United States from a limited Chinese ICBM attack, they will never be in a position where a disarming first strike would be rational.

Hans M. Kristensen, Director of the Nuclear Information Project at the Federation of American Scientists, agrees with Waltz.[13] He cites the 2015 Department of Defense annual report on the Chinese military, which was the first affirmation by the

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[11] "How Is China Modernizing Its Nuclear Forces?," ChinaPower Project, December 18, 2019, https://chinapower.csis.org/china-nuclear-weapons)

[12] Sagan, Scott Douglas., and Kenneth Neal Waltz. *The Spread of Nuclear Weapons: an Enduring Debate: with New Chapters on Iran, Iraq, and North Korea, and on the Prospects for Global Nuclear Disarmament*. Thirded. New York, NY: Norton, 2013. Pg. 7.

[13] Hans M. Kristensen, "Pentagon Report: China Deploys MIRV Missile," Federation Of American Scientists, May 11, 2015, https://fas.org/blogs/security/2015/05/china-mirv/)

American military that China had deployed MIRV capability on DF-5B ICBMs capable of reaching the United States. The report concludes the reasoning for China's development of MIRV technology is "intended to ensure the viability of China's strategic deterrent in the face of continued advances in U.S. and, to a lesser extent, Russian strategic ISR, precision strike, and missile defense capabilities."[14] By the Pentagon's own admission, it is Washington's continued advancement in missile defense and upgraded strike technology that is forcing China to build up its own arms in response. Kristensen sums up the how counterproductive the missile defense endeavor is:

> "… how ironic that the US missile defense system – intended to *reduce* the threat to the United States – instead would seem to have *increased* the threat by triggering development of MIRV on Chinese ballistic missiles that could destroy more US cities in a potential war."[15]

Kristensen's view is shared by many political science scholars and defense analysts. Waltz agrees, stating that the worst thing about missile defense "is that merely setting development and deployment in motion has damaging effects on us and others."[16] This demonstrates that some of the world's leading analysts and even many in the American Department of Defense agree that missile defense is damaging to national security.

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[14] "ANNUAL REPORT TO CONGRESS: Military and Security Developments Involving the People's Republic of China 2019." Department of Defense. Department of Defense, May 2, 2019.Page 31.

[15]Hans M. Kristensen, "Pentagon Report: China Deploys MIRV Missile," Federation Of American Scientists, May 11, 2015, https://fas.org/blogs/security/2015/05/china-mirv/).

[16] Sagan, Scott Douglas., and Kenneth Neal Waltz. *The Spread of Nuclear Weapons: an Enduring Debate: with New Chapters on Iran, Iraq, and North Korea, and on the Prospects for Global Nuclear Disarmament*. Thirded. New York, NY: Norton, 2013. Pg. 103.

Perhaps most dangerous of all, Waltz argues that the "shield makes the sword usable."[17] Even if American civilian and military leaders never plan to make an offensive first strike on an adversary, any potential nuclear-equipped foe is forced to innovate to defeat the perception that their own deterrent may not be credible in the face of a disarming first strike coupled with a missile defense shield to eliminate any warheads not destroyed on the ground. China has been placed in just this situation and has acted according to what Waltz and Kristensen would have predicted.

Arguments in Favor of American Ballistic Missile Defense and Nuclear Modernization

Elbridge Colby, former US Deputy Assistant Secretary of Defense for Strategy and Force Development, claims in the title of a recent article, "If You Want Peace, Prepare for Nuclear War."[18] Colby argues for a nuclear warfighting strategy with flexible response options for the American military because he believes that "threatening to use [strategic] weapons in a limited war in defense of allies thousands of miles from U.S. shores is just too extreme to be convincing and therefore unlikely to work."[19] The logic Colby uses in defense of his position—chiefly that some American interests overseas are peripheral—is actually not too far off the same logic employed by Waltz, though the latter disagrees completely on the necessity of flexible nuclear warfighting capabilities. Both parties agree that the United States would be unlikely to employ strategic nuclear weapons in defense of interests whose coverage by the

[17] Ibid, 105.
[18] Elbridge Colby, "If You Want Peace, Prepare for Nuclear War," Foreign Affairs, January 28, 2019, https://www.foreignaffairs.com/articles/china/2018-10-15/if-you-want-peace-prepare-nuclear-war)
[19] Ibid.

American deterrent is cloudy. Waltz claims, “Nuclear weapons deter adversaries from attacking one’s vital—and not one’s minor—interests.”[20] Colby argues that only through developing a flexible tactical nuclear response can the United States effectively deter far-flung allies who are potentially vulnerable to Chinese and Russian attacks. He specifically lists Taiwan and Japan as targets of potential Chinese aggression.[21]

Colby goes on to claim that the United States has fallen behind Russia and China’s ability to conduct limited nuclear war. He references the 2018 Nuclear Posture review’s acknowledgment of this “gap” and claims that even the extensive modernization campaigns called for by the report fall short of providing the American military with the respective response options he is arguing for. Specifically, Colby calls on the United States to “develop modern tactical nuclear warheads and delivery systems designed for a regional military fight.”[22] This would require massive investments to be made into further updating the American nuclear arsenal beyond the what is called for in the 2018 Nuclear Posture Review. The United States’ nuclear arsenal is currently designed to effectively deter a Cold War era opponent, rather than a regional nuclear power seeking to claim territory, Colby claims, and it thus not suited for the modern security environment.[23]

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[20] Scott Douglas Sagan, and Kenneth Neal Waltz. “The Spread of Nuclear Weapons: an Enduring Debate: with New Chapters on Iran, Iraq, and North Korea, and on the Prospects for Global Nuclear Disarmament.” Thirded. New York, NY: Norton, 2013. Pg. 16.
[21] Ibid.
[22] Elbridge Colby, “If You Want Peace, Prepare for Nuclear War,” Foreign Affairs, January 28, 2019, https://www.foreignaffairs.com/articles/china/2018-10-15/if-you-want-peace-prepare-nuclear-war
[23] Ibid.

In order to protect American regional allies—chiefly Taiwan and Japan—the United States needs to build tactical nuclear weapons that allow Washington to threaten a diversified nuclear and conventional response to regional Chinese aggression. Colby claims in a hypothetical scenario that China could use force to invade and occupy Taiwan. In response a limited nuclear option would allow American forces to target and destroy all Chinese tactical nuclear and conventional forces earmarked for use in the campaign.[24] This reasoning assumes that Washington's limited preemptive tactical nuclear strike on China's tactical nuclear arms would not be seen by Beijing as the grounds to launch a second strike on the United States. Beijing maintains a no-first use policy regarding its nuclear weapons and would thus be unlikely to use them first even in a limited nuclear war of aggression.[25] Colby does not address the extreme risks that the United States would have to consider before striking any of China's nuclear arsenal, whether they be tactical or strategic weapons. It would not be hard to imagine Chinese leaders perceiving any American attack, conventional or nuclear, on any hypothetical tactical Chinese nuclear weapons as an attempt at a disarming first strike, which could force Chinese leaders—observing an imminent threat to their ability to deter any further American aggression—into a "use it or lose it" mentality. If this was the case, both the United States and Chinese would suffer heavy casualties in the nuclear exchange sure to follow.

[24] Ibid.
[25] "National Intelligence Council," Federation Of American Scientists – Science for a safer, more informed world., accessed May 19, 2020, https://fas.org/irp/threat/missile/nie99msl.htm).

Methods of Analysis Overview

The following methodologies will be used to prove that an American arms race with China is not inevitable:

Budgetary Analysis

American and Chinese defense expenditures will be compared respectively over the past two decades. American budgets will be drawn from official American defense white papers, while Chinese reports will rely on estimates from the American intelligence community and independent analysts. This is due to the fact that there are often considerable discrepancies between what the Chinese military claims it spends and what outsiders estimate are actual expenditures.[26]

Outline of Alleged Tit-for-Tat

This section will provide specific dates to deliver background and context for the current geopolitical situation between the United States and China. By peeling back the curtain of history insights will be generated about which side may have been provoking action by the other. This will also serve to examine whether the actions of either country were related to relative changes in overall posturing through both rhetoric and concrete measures.

Key Weapons Systems

Through analysis of key weapons systems on both sides of the Pacific, this section will assess the capabilities resulting from new advances in military technology.

[26] "What Does China Really Spend on Its Military?," ChinaPower Project, May 15, 2020, https://chinapower.csis.org/military-spending/

The weapons systems that will receive the most attention in this report are the same that have received the most attention by the American press and officials. Specifically, this report will focus on Chinese hypersonic weapons, and Chinese MIRV technology in addition to American efforts at developing and deploying a national missile defense.

Analysis of the Hype the Chinese Threat

Finally, this report will offer commentary and analysis of the developments often pointed to as evidence that the United States should focus military spending on countering China. In this section the strategic implications of the aforementioned Chinese weapons systems will be analyzed, in addition to argumentative holes in favor of an American national missile defense, a potential Taiwan crisis, and the Chinese island-building and militarization campaign in the South China Sea. Through analyzing the sources of hype and excitement on all of these issues we can see how American strategic nuclear security is impacted and determine whether any of these actions make an arms race inevitable.

Budgetary Analysis

The Chinese People's Liberation Army has seen its budget increase every year since 2000—often with double-digit percentage increases.[27] The Stockholm International Peace Research Institute has estimated these annual increases in spending have raised total Chinese military expenditures from $41.3 billion in 2000 to $239.2 billion in 2018 (in nominal 2017 USD).[28] This represents an increase in Chinese defense spending of 479% over 18 years. Many in the United States have pointed to the fact that American military spending has only increased 47.5% in the same time period (from $429.5bn in 2000 to $633.6bn in 2018) as reason to be concerned, though percentage increases do not explain the whole picture.

Total American military spending still dwarfs total Chinese spending with aggregate Chinese expenditures totaling only 37.8% of the 2018 American military's annual appropriations.[29] The United States has sustained a high level of spending since World War II, as Cold War tensions provided the motivation for massive military arms races and budgets. Additionally, global commitments such as the recent wars in Iraq and Afghanistan have given the United States military further reason to continuously invest in robust military capabilities. This sustained spending for the better part of a century has allowed the United States armed forces to have a considerable stockpile of technical expertise and warfighting materiel to draw upon.

[27] "China Is World's Biggest Exporter of Armed Drones, Says Report," South China Morning Post, March 11, 2019, https://www.scmp.com/news/china/military/article/2189604/china-sells-weapons-more-countries-and-biggest-exporter-armed)
[28] "What Does China Really Spend on Its Military?," ChinaPower Project, May 15, 2020, https://chinapower.csis.org/military-spending/)
[29] Ibid.

By comparison, the People's Liberation Army has more or less had to play catch-up to capabilities the American military has enjoyed for years.

Milestone	China	year	gap	year	USA
1st H-bomb test	CHIC 6	1967	13	1954	TX-14
Atomic Submarine, launch	Type 091	1970	16	1954	Nautilus
Supersonic Aircraft, 1st flight	Q5	1965	18	1947	X-1
1st A-bomb test	CHIC 1	1964	19	1945	Trinity
5th Generation Fighter, 1st flight	J-20	2010	20	1990	F-22
ICBM, 1st flight	DF-5	1979	22	1957	Atlas
SLBM, 1st flight	JI-1	1982	22	1960	Polaris
Ballistic Missile Submarine, launch	Type 092	1981	22	1959	Washington
Anti-Satellite Interceptor, 1st flight	SC-19	2007	22	1985	ALMV
4th Generation Fighter, 1st flight	J-10	1996	24	1972	F-15
Stealth Aircraft, 1st flight	J-20	2010	29	1981	F-117
Solid ICBM, 1st flight	DF-31	1992	31	1961	Minuteman
Long Range SLBM, 1st flight	JI-2	2001	34	1977	Trident I

Figure 1: Significant Military Milestones of the United States and China.[30]

This is particularly the case in terms of nuclear and power projection capabilities, where the United States has long held a significant advantage. The significant gaps seen in Figure 1 demonstrate how the Chinese military, even in recent years, has lagged significantly behind the United States in terms of technical prowess and capabilities.

One potential reason the Chinese military has seen its budget increase so substantially is that the budget is linked to the country's overall economy. China's gross domestic product (GDP) has grown significantly since 2001, when Beijing officially joined the World Trade Organization (WTO).[31] China's economy has exploded as greater access to world financial markets and international capital surged into the country. As China's economy grew, so too did its military expenditures, though the Chinese Communist Party (CCP) has devoted relatively lower resources to the military compared to the United States over the same period.

[30] John Pike, "Military," People's Liberation Army Versus the US Military, accessed May 19, 2020, https://www.globalsecurity.org/military/world/china/pla-v-us.htm)
[31] "WORLD TRADE ORGANIZATION," WTO, accessed May 19, 2020, https://www.wto.org/english/thewto_e/countries_e/china_e.htm)

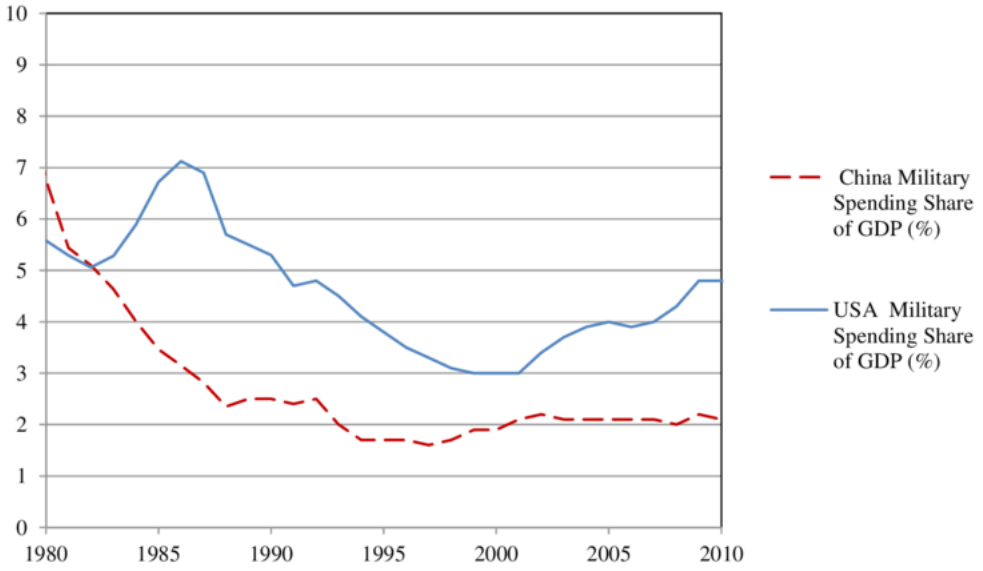

Figure 2: American and Chinese Military Spending as a Percentage of GDP[32]

The extraordinary growth of China's economy has allowed Beijing's military budget to expand, not a change in government priorities. As the Chinese state has grown more prosperous in recent years, the government has been able to devote more of the share of funding away from military uses, even as total military spending has increased every year.[33] This is demonstrated in the following figure.

[32] Peter E Robertson, "Measuring Hard Power: China's Economic Growth and Military Capacity," Research Gate, March 2015, https://www.researchgate.net/figure/Military-Spending-Share-of-GDP_fig2_275338533)

[33] "China's Defence Spending: a Question of Perspective?," IISS, accessed May 19, 2020, https://www.iiss.org/blogs/military-balance/2019/05/china-defence-spending)

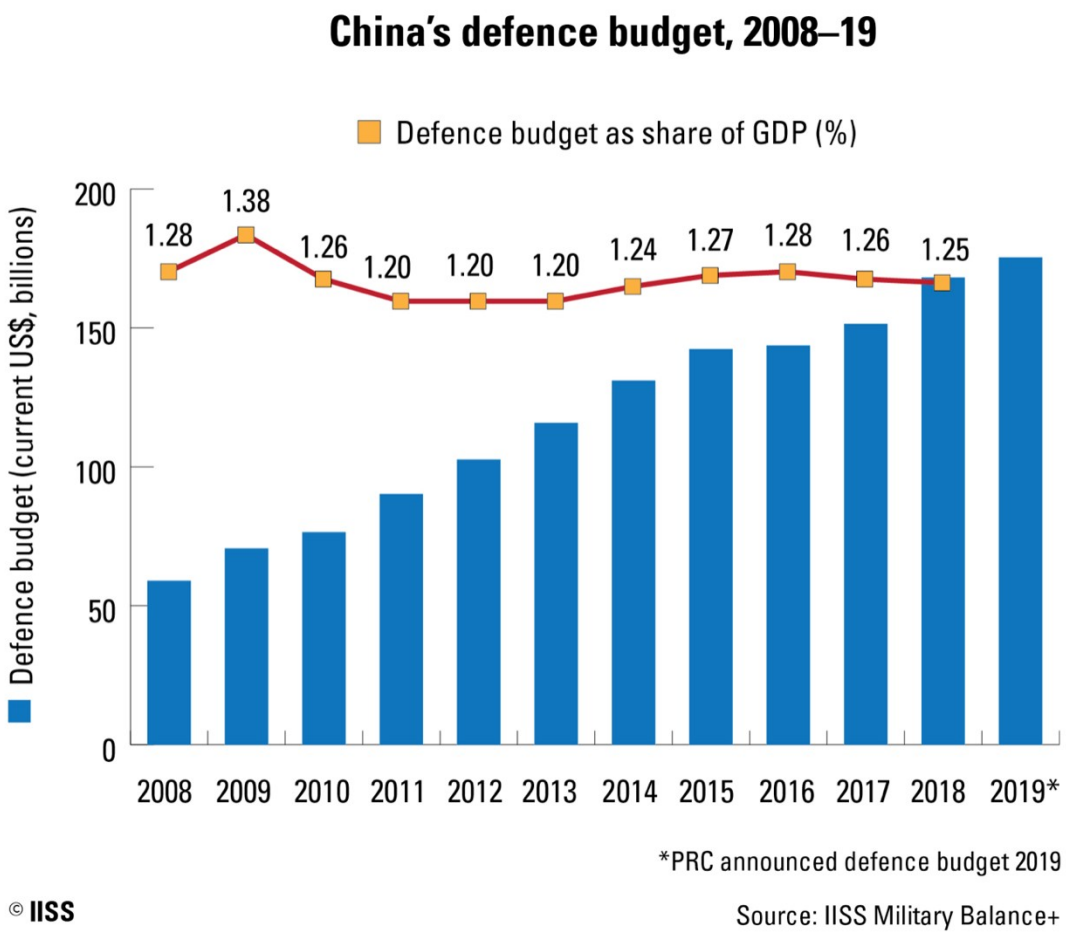

Figure 3: Chinese Defense Budget as a Share of GDP (%)

China does not disclose many details of their military spending, though given the numbers and types of new nuclear weapons systems under development, it seems likely that Beijing is also devoting a significant share of military appropriations to nuclear modernization through new solid-fueled road-mobile ICBMs and a substantial nuclear submarine research and development program.[34]

Some experts have argued that when American and Chinese military budgets are compared using purchasing power parity (PPP) rather than nominal dollar amounts that

[34] "What Does China Really Spend on Its Military?," ChinaPower Project, May 15, 2020, https://chinapower.csis.org/military-spending/)

Chinese spending is much closer to the level of the United States.[35] One report from the World Bank finds that, given the same amount of USD spent, China can effectively purchase 2.5x more domestically per dollar than the United States.[36] While this argument makes it seem as though China can stretch military spending farther, a country's nationwide purchasing power is not directly correlated with the costs of military equipment and procurement.[37]

While nominal budgetary comparisons omit details that can have significant influences across different national economies, the lack of transparency in the Chinese military reporting structure makes comparisons by PPP equally arbitrary.[38] Therefore, making defense budgeting decisions based off relative spending by an adversary does not make for an effective fiscal strategy. Spending the appropriate amount needed to maintain national security is a more effective strategy than reacting to budgetary posture changes by an adversary. The following figure displays the nominal defense budgets of the United States, China, and Russia. Though both the China and Russia demonstrate significant growth in military expenditures over the time period, note that the United States maintains a significant lead throughout.[39] This provides more evidence of

[35] "Price Level Ratio of PPP Conversion Factor (GDP) to Market Exchange Rate," International Comparison Program Database (The World Bank), accessed May 19, 2020, http://data.worldbank.org/indicator/pa.nus.pppc.rf)
[36] Ibid.
[37] Rachel Zissimos, "Putting Defense Spending in Context: Simple Comparisons Are Inadequate," The Heritage Foundation, accessed May 19, 2020, https://www.heritage.org/defense/report/putting-defense-spending-context-simple-comparisons-are-inadequate)
[38] "Frequently Asked Questions," SIPRI, accessed May 19, 2020, https://www.sipri.org/databases/milex/frequently-asked-questions#PPP)
[39] Katharina Buchholz and Felix Richter, "Infographic: China's Increased Military Spending That Trump Cancelled the INF Treaty

Washington's enduring lead in defense spending and the accrued advantages of expertise and procurement over time.[40]

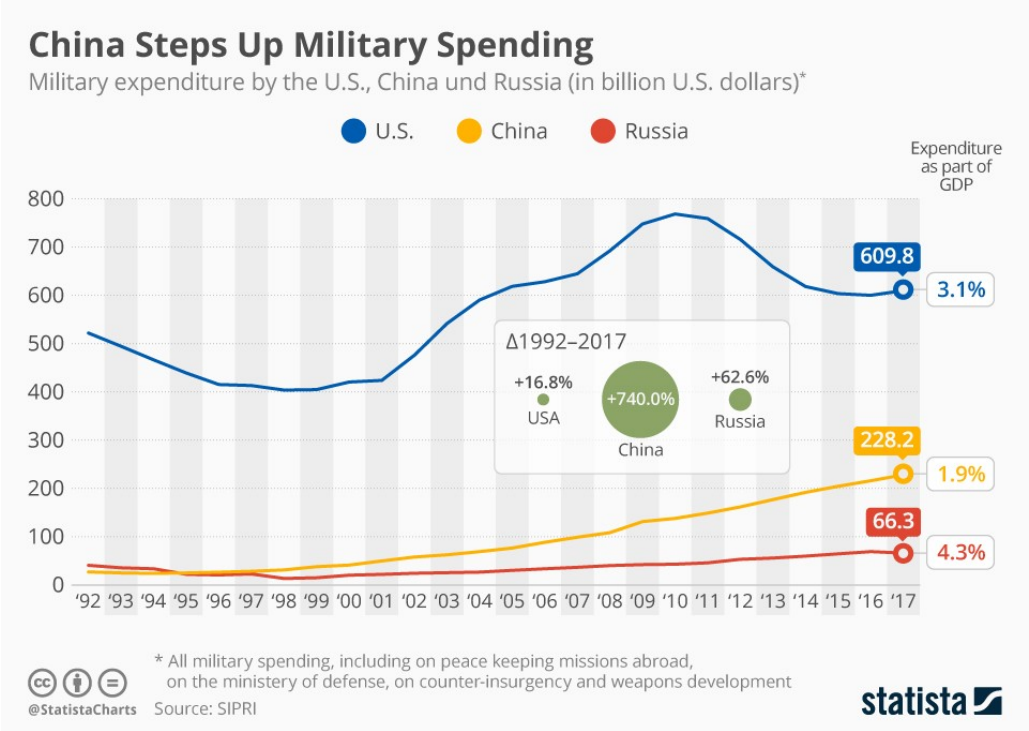

Figure 4: Chinese and Russian Military Spending Relative to the United States in Nominal 2017 USD[41]

The United States is also planning a significant overhaul to its nuclear arsenal with projected costs of nuclear modernization over the next 30 years exceeding $1.7 trillion when adjusted for inflation.[42] While this is surely a significant cost, the figure is not expected to exceed more than 6% of total American defense spending over the period.[43]

For," Statista Infographics, February 1, 2019, https://www.statista.com/chart/16878/military-expenditure-by-the-us-china-and-russia/)

[40] Ibid.

[41] Ibid.

[42] "Fact Sheets & Briefs," U.S. Nuclear Modernization Programs | Arms Control Association, accessed May 19, 2020, https://www.armscontrol.org/factsheets/USNuclearModernization)

[43] Ibid.

The massive amounts the Washington is committed to keep spending on its armed forces has a historical precedent and the United States has demonstrated a proven capability to maintain high levels of spending over long time frames even in the midst of other challenges at home and abroad while the Chinese government's military expenditures in large part dependent on the ability of its economy to continue to grow.

Timeline of Alleged Tit-for-Tat

American Missile Defense has Focused on China Since the Beginning

In the midst of the Cold War the United States made several attempts at fielding a national missile defense system. Each attempt was met with significant political and technical hurdles on the way to becoming operational, but rather than cancel the programs outright, the systems were repurposed. Specifically, national missile defense projects were adapted from defending against the incumbent Soviet threat to the emerging—and limited—Chinese threat.

Early American Missile Defense Efforts

American military planners have dreamed of a missile defense program since the end of World War II. Work began in earnest on a missile defense system in the midst of the Cold War when the Nike-Zeus system received funding in 1956.[44] The Nike-Zeus system evolved from the previous 1954 Nike-Ajax anti-aircraft system, designed to target and destroy subsonic strategic bombers at high altitude. Even as the Ajax system was being deployed, it became apparent that ICBMs were developing into the principle nuclear threat facing the United States. To address this, the Nike-Zeus system was developed as the first ABM (anti-ballistic missile) system fielded by any nation. The system required a "95-100%" defense rate to be considered operationally effective, which led to the decision to employ nuclear warheads on the interceptor missiles themselves, designed to detonate at altitude to destroy volleys of incoming

[44] "US Ballistic Missile Defense Timeline: 1945-Today." Union of Concerned Scientists. Accessed April 28, 2020. https://www.ucsusa.org/resources/us-missile-defense-timeline.

ICBMs simultaneously.[45] Very quickly the United States Army, tasked with point defense (defending against static targets like cities), encountered serious operational limitations with the Nike-Zeus system.

The radar targeting and computing technology of the time was only capable of first tracking one, and then single-digit numbers of incoming targets simultaneously.[46] This meant that the system was quickly overwhelmed even by relatively small quantities of missiles incoming simultaneously. Due to the high required interception rates to consider the system a success, the technology of the time limited the Nike-Zeus system's ability to perform when fielded.

Additionally, the system was crippled in the event multiple volleys of ICBMs were launched. Nike-Zeus could eliminate the first wave fairly effectively, but the atmospheric nuclear blast caused by the Nike-Zeus warhead's detonation would create an environment in the upper atmosphere where the system's own ground-based radars would be blinded by the resultant radio interference. This crippling weakness was never overcome in the design process and plans for a wide deployment of Nike-Zeus suffered greatly and were eventually cancelled in early 1963.[47]

Following the cancellation of the Nike-Zeus program, the Soviet Union deployed the limited "Galosh" ABM system as a point-defense system designed to protect Moscow from an American ICBM attack. Like its contemporary American counterparts, the Galosh was unable to stop any large missile attacks but was

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[45] "Nike Zeus: The U.S. Army's First Anti-Ballistic Missile." Missile Defense Agency, October 20, 2009. https://www.mda.mil/global/documents/pdf/zeus.pdf.
[46] Ibid.
[47] Ibid.

nonetheless deployed with an estimated 64 nuclear-tipped interceptor missiles across 4 launch sites.[48] When reports of the Soviet system were picked up by the media there was public outcry within the United States for the deployment of an American ABM system.[49] Secretary of Defense Robert McNamara had always been critical of the idea of fielding a nationwide ABM system because he feared such a system would have a destabilizing effect on the security situation under the logic of mutually assured destruction (MAD).[50] Additionally, McNamara determined an ABM system could not be developed to the scale required to defend the United States from a Soviet ICBM attack consisting of thousands of warheads.[51] A smaller, "light" system could still be deployed, but could only be effective against a smaller threat.[52]

American Missile Defense Targets China

The Johnson administration instead offered to deploy a limited missile defense system with the rationale that it would be small enough not to destabilize the strategic balance of power with the Soviet Union, but large enough to offer considerable protection against the arrival of the Chinese nuclear deterrent. China had tested its first nuclear device in 1964, and American projections estimated a Chinese nuclear deterrent

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[48] "SMDC History: Soviet Union Deploys Galosh." www.army.mil. Accessed April 28, 2020. https://www.army.mil/article/177997/smdc_history_soviet_union_deploys_galosh.
[49] Ibid.
[50] "National Missile Defense History." IOP Science. Morgan & Claypool Publishers, June 2018. https://iopscience.iop.org/book/978-1-6817-4942-6/chapter/bk978-1-6817-4942-6ch1.
[51] Ibid.
[52] Robert S. McNamara. "Remarks by Secretary of Defense Robert S. McNamara, September 18, 1967" *Bulletin of the Atomic Scientists*XXIII, no. 10 (December 1967): 26–31.

would be reasonable to build a missile defense system to counter, given the significantly smaller projected number of Chinese ICBMs that would be capable of reaching the United States.[53] In remarks given in September of 1967, Secretary of Defense McNamara announced the United States would build a "light" "Chinese-oriented" missile defense system to defend against "conditions under which China might miscalculate."[54] McNamara acknowledged the danger in building a larger "heavy" ABM system aimed at defending against Soviet attacks noting that if the Soviets perceived that their own nuclear second-strike capability was threatened by the existence of an American ABM system there would be "a strong inducement for the Soviets to vastly increase their own offensive forces."[55] McNamara seemed relatively unconcerned with the Chinese responding by building up nuclear arms to overwhelm an American missile defense system, possibly due to the fact that tensions between the two countries were relatively low compared to the tensions between the United States and Soviet Union at that time.

The system McNamara ordered built was named Sentinel. Sentinel was tasked with providing "area protection for US population centers against a possible Chinese missile attack."[56] The Sentinel system could also be used to "defend [American] land-based deterrent forces against a larger Soviet threat."[57] The latter objective would be the

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[53] Ibid.
[54] Robert S. McNamara. "Remarks by Secretary of Defense Robert S. McNamara, September 18, 1967" *Bulletin of the Atomic Scientists*XXIII, no. 10 (December 1967): 26–31.
[55] Ibid.
[56] Department of the Army Historical Summary, FY 1969 (Washington,D.C.: U.S.ArmyCenterofMilitaryHistory,1973,pp.31-33,89-90.
[57] Ibid

primary purpose of the system eventually deployed, renamed Safeguard and only tasked with defending American silo-based ICBMs from Soviet and Chinese first strike attacks, although McNamara himself noted the system could only defend against limited "light" strikes.[58]

American Missile Defense Temporarily Shelved

McNamara's proposed limited ballistic missile defense was short lived. While Safeguard was under development prior to installation around ICBM silos in North Dakota, the United States and Soviet Union signed the Anti-Ballistic Missile Treaty (ABM) in 1972, eliminating the possibility of growing the system to provide a "heavy" nationwide missile defense against a Soviet strike.[59] The single Sentinel site that had been initially constructed in North Dakota was kept on by the United States under the provisions of the ABM Treaty and was eventually decommissioned in 1976 due to insurmountable technical constraints caused by the operation of the system itself. Specifically, the blinding effect of detonating the nuclear warheads carried onboard interceptor missiles on the ground-based radars and the extreme financial costs associated with the project were cited as reasons for its cancellation.[60] The House Appropriations Committee and later the Senate voted to dismantle the site entirely after less than a year of operational testing, citing that as the "Soviet Union installed

[58] Robert S. McNamara. "Remarks by Secretary of Defense Robert S. McNamara, September 18, 1967" *Bulletin of the Atomic Scientists*XXIII, no. 10 (December 1967): 26–31.
[59] "Fact Sheets & Briefs," The Anti-Ballistic Missile (ABM) Treaty at a Glance | Arms Control Association, accessed May 19, 2020, https://www.armscontrol.org/factsheets/abmtreaty)
[60] "Fact Sheets & Briefs." The Anti-Ballistic Missile (ABM) Treaty at a Glance | Arms Control Association. Accessed May 14, 2020. https://www.armscontrol.org/factsheets/abmtreaty.

offensive missiles with multiple warheads the usefulness of Safeguard missiles would be "essentially nullified."[61] By the time Safeguard was cancelled China had yet to field an ICBM capable of reaching the United States (it wouldn't be until 1981 that the DF-5 ICBM would be operationally deployed), thus the system the Johnson Administration had called for to defend against a potential miscalculated Chinese ICBM strike was never even operational at the same time such a threat even existed.[62]

Missile Defense Takes Center Stage in the Final Years of the Cold War

Following the decade of détente Ronald Reagan was elected to the office of President and set his eyes on the stars. Reagan proposed the Strategic Defense Initiative (SDI)—"Star Wars" as it was known by its critics—with the goal of making nuclear weapons "impotent and obsolete."[63] SDI proposed an immensely complex system of orbital lasers and interceptors designed to destroy incoming ICBMs in space.[64] While many in the American public approved of the proposed system, the international community—and many within Reagan's own administration—were shocked at what the president had proposed. SDI as a concept was based on "technology that had not yet

[61] John W. Finney. "Safeguard ABM System to Shut Down; $5 Billion Spent in 6 Years Since Debate." The New York Times. The New York Times, November 25, 1975. https://www.nytimes.com/1975/11/25/archives/safeguard-abm-system-to-shut-down-5-billion-spent-in-6-years-since.html.l

[62] "DF-5 (Dong Feng-5 / CSS-4)." Missile Threat. Accessed May 14, 2020. https://missilethreat.csis.org/missile/df-5-ab/.

[63] "Arms Control Today." LOOKING BACK: The Nuclear Arms Control Legacy of Ronald Reagan | Arms Control Association. Accessed May 14, 2020. https://www.armscontrol.org/act/2004_07-08/Reagan.

[64] "Strategic Defense Initiative (SDI)." Atomic Heritage Foundation, July 18, 2018. https://www.atomicheritage.org/history/strategic-defense-initiative-sdi.

been invented" and thus posed massive challenges for the American scientific and defense communities tasked with its development.[65]

The SDI program spent through billions in defense appropriations under Reagan, but by the end of his presidency had little to show for all of the time and resources spent. The program would ultimately lead to the inability of the United States and Soviet Union to reach an agreement at the 1986 Reykjavik Summit to achieve unprecedented disarmament, as Reagan refused to give up the program even in exchange for Soviet concessions.[66]

After Reagan's presidency and collapse of the Soviet Union funding for SDI faded as national security concerns evolved and the United States took on other priorities. The program was never officially cancelled and has continued under different names with different objectives under subsequent administrations.[67] Today, the legacy of SDI is the Missile Defense Agency, explored in a later section.

The Rumsfeld Commission: Missile Defense Reenters Debate

The Clinton administration saw heated partisan fighting in the Senate about appropriations for missile defense. A commission chaired by Senate Republican Donald Rumsfeld in 1998 argued for increased missile defense spending but used widely disputed information to provide evidence as to a missile defense system's practicality.

The Commission to Assess the Ballistic Missile Threat to the United States (henceforth known as the Rumsfeld Commission) was part of a larger push within the

[65] Ibid.
[66] Ibid.
[67] Ibid.

United States Senate among a group of fervent missile defense advocates.[68] The report produced by the commission was intended to prove the necessity of an American missile defense system and often took worst-case estimates of the capabilities and intents of potentially hostile foreign powers, rather than focusing on what was likely to occur.[69] For instance, contrary to the estimates of the overall American intelligence community, the 1998 report claimed that within 5 years a rogue nation would have the capability of launching an ICBM at the continental United States.[70] To make this assessment, the commission lowered the threshold of what was considered a threat to what "could" happen rather than what was "likely" to occur.[71] This effectively made the threat of long-range ballistic missiles to the United States homeland more pressing than the military and intelligence community had previously determined in their own reports. By lowering the burden of proof, the report was able to achieve its goals of making missile defense a core issue in American politics in the post-Cold War Era.

The Commission found the "threat to the U.S. posed by these emerging capabilities is broader, more mature and evolving more rapidly than has been reported in estimates and reports by the Intelligence Community."[72] The report essentially

[68] "Missile Wars | FRONTLINE." PBS. Public Broadcasting Service, October 10, 2002. https://www.pbs.org/wgbh/pages/frontline/shows/missile/.
[69] Ibid.
[70] Ibid.
[71] "Arms Control Today." Rumsfeld Reprise? The Missile Report That Foretold the Iraq Intelligence Controversy | Arms Control Association. Accessed May 14, 2020. https://www.armscontrol.org/act/2003-07/features/rumsfeld-reprise-missile-report-foretold-iraq-intelligence-controversy#notes.
[72] Rumsfeld, Donald H. "COMMISSION TO ASSESS THE BALLISTIC MISSILE THREAT TO THE UNITED STATES." Commission to Assess the Ballistic Missile Threat, July 15, 1998. https://fas.org/irp/threat/bm-threat.htm.

undermines the more realistic conclusions reached by the broader American intelligence apparatus regarding the immediacy of a threat to the Unites States. The timeliness of the report was an important factor to its lasting impact. Even though many facts and figures had been stretched and the timelines shortened for so-called rogue states to attain long-range nuclear-capable missile technology, when North Korea launched the Taepo Dong missile only six weeks later the Rumsfeld Commission's conclusions suddenly seemed justified.[73] Donald Rumsfeld himself expressed his apparent satisfaction that the commission's findings had been vindicated, saying "God bless you Kim Jong."[74]

Top military officials still fought against the proposed development and deployment of a national missile defense system, arguing that any rogue regime need not waste time and resources developing a sophisticated long-range missile program. The Joint Chiefs of Staff at the time claimed "unconventional, terrorist-style delivery means" would be a much more likely threat to the United States from a rogue regime.[75] Why would a backwards state like North Korea devote treasure toward an ICBM program when they could instead use smuggling and other techniques to circumvent even the most robust American missile defense system?

Regardless of long-term feasibility or the actual credibility of Pyongyang's nascent threat, North Korea's apparent breakthrough in three-stage missile technology would give new life to advocates of a national missile defense.

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[73] "Missile Wars | FRONTLINE." PBS. Public Broadcasting Service, October 10, 2002. https://www.pbs.org/wgbh/pages/frontline/shows/missile/.
[74] Ibid.
[75] Ibid.

Missile Defense Becomes American Policy

In 1999 the United States Congress passed National Defense Authorization Act, which included provisions for a national missile defense system as a formal part of American defense policy. The goals of national missile defense are

> "…to maintain and improve an effective, robust layered missile defense system capable of defending the territory of the United States, allies, deployed forces, and capabilities against the developing and increasingly complex ballistic missile threat…"[76]

The Clinton administration would be relatively restrained in ceding substantial ground to advocates of national missile defense, by remaining a party to the ABM Treaty and ensuring missile defense was an area for research, not imminent deployment. The following administration would have no qualms withdrawing from arms control agreements and pursuing national missile defense deployment.

2000-2010: American Unipolarism and Chinese Growth

American Withdrawal from the ABM Treaty

When George W. Bush came to power in the United States in 2001, the United States was at peace. By the end of his first year in office, that would all change. The September 11, 2001 terrorist attacks would shake the American public and prompt the new administration to launch the country headfirst into an enduring "War on Terror."[77] After 9/11, the Bush administration claimed that the Anti-Ballistic Missile (ABM)

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[76] "U.S. Department of Defense - Missile Defense Agency," MDA, accessed May 19, 2020, https://www.mda.mil/about/mission.html)
[77] "The Global War on Terrorism: The First 100 Days," U.S. Department of State Archive (U.S. Department of State, January 2009), https://2001-2009.state.gov/s/ct/rls/wh/6947.htm)

Treaty was not suited to contemporary American security needs.[78] With a new focus on combating terrorism, Bush sought the capacity to defend against missiles launched from terrorist organizations and so-called "rogue-states."[79] To meet this goal, the provisions outlined in the landmark Cold War ABM Treaty would be jeopardized, potentially at the stake of long-term worldwide strategic security.

The ABM Treaty was an agreement between the United States and Russia (the Soviet Union at the time of signing in 1972). The treaty prohibited either party from developing national missile defenses that would have been detrimental to other nuclear powers' security. The agreement specifically prohibited either nation from developing a national missile defense against ICBMs, which the Bush administration argued were needed in the post 9/11 era. The 9/11 attacks gave Bush and his Secretary of Defense and long-time missile defense advocate Donald Rumsfeld the political justification they needed to withdraw from the treaty, which was announced in December, just months after the 9/11 attacks.[80]

Following the withdrawal from the ABM Treaty, the Bush administration formed the Missile Defense Agency (MDA) with a mandate to develop and deploy a layered Missile Defense System to "defend the United States, its deployed forces, allies, and friends from missile attacks in all phases of flight."[81] This broad mandate enabled the MDA to bring together knowledge and expertise in missile defense technology

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[78] "Fact Sheets & Briefs." The Anti-Ballistic Missile (ABM) Treaty at a Glance | Arms Control Association. Accessed May 14, 2020. https://www.armscontrol.org/factsheets/abmtreaty.
[79] Ibid.
[80] Ibid.
[81] "U.S. Department of Defense - Missile Defense Agency," MDA, accessed May 19, 2020, https://www.mda.mil/about/mission.html)

under one organization. In 2002, Bush's Secretary of State, Donald Rumsfeld gave the Missile Defense Agency the mandate of deploying the Ground-Based Midcourse Defense (GMD) System by 2004.[82] GMD remains the only missile defense system fielded by Washington with the objective of defending the entire continental United States.[83]

China Responds to American Missile Defense Objectives

Prior to the American withdrawal from the ABM Treaty , in July 2000 Chinese ambassador Sha Zukang described American missile defense efforts as a "direct threat to the effectiveness of China's existing limited nuclear force," claiming China, "While determining the scale of its nuclear force, [cannot] but consider [missile defense]" as a factor.[84] Later in November 2000, an official of the Chinese Foreign Ministry claimed, "As far as the US National Missile Defense is concerned if we are to protect stability of the global strategic balance, then this system shouldn't be built."[85]

Though China was not a signatory to the ABM Treaty, the restrictions placed on the preeminent nuclear powers had allowed the Chinese government to comfortably rely on a relatively small nuclear deterrent of hundreds—rather than thousands—of

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[82] Missile Defense Project, "Ground-based Midcourse Defense (GMD) System," Missile Threat, Center for Strategic and International Studies, June 14, 2018, last modified June 15, 2018, https://missilethreat.csis.org/system/gmd/.
[83] Ibid.
[84] "Chinese Arms Control Head on Opposition to US Missile Defense Plan," Wen Wei Po via BBC Summary of World Broadcasts, 12 July 2000, in Lexis Nexis, http://web.lexis-nexis.com.
[85] "China Voices Agreement Over US-Russia Nuclear Missile Reductions," Agence France Presse, 14 November 2000, in Lexis Nexis, http://web.lexis-nexis.com.

warheads.[86] With the withdrawal of the United States from the ABM Treaty and the Bush administration's emphasis on deploying a national missile defense as soon as possible, Beijing was forced to begin research and development of technologies specifically designed to counter any eventual possible American national missile defense capabilities.[87]

The most significant new Chinese nuclear weapons system fielding during this decade was the solid-fueled road-mobile DF-31 in 2006. The DF-31 is capable of targeting parts of the western United States from launchers in mainland China.[88] The DF-31 was developed alongside the JL-2 SLBM, which would not be deemed operational aboard Jin-class submarines until 2015, following another decade of testing and development.[89] Additionally, China began developing the DF-41 ICBM in earnest in the early 2000s, though the initial research is estimated to have begun in the 1980s according to estimates from industry experts.[90] The DF-41 is an evolution of the DF-31 missile and is the first Chinese ICBM to be developed from the beginning to be equipped with MIRV technology.[91] While not officially disclosed in Chinese defense

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[86] Kristensen, Hans M. "No, China Does Not Have 3,000 Nuclear Weapons." Federation Of American Scientists, December 3, 2011. https://fas.org/blogs/security/2011/12/chinanukes/.
[87] Kristnesen, Hans M., and Robert S. Norris. "Chinese Nuclear Forces, 2011." Bulletin of the Atomic Scientists, 2011. https://journals.sagepub.com/doi/pdf/10.1177/0096340211426630.
[88] "Arms Control Today," China Tests DF-31 Missile | Arms Control Association, accessed May 19, 2020, https://www.armscontrol.org/node/2881)
[89] Missile Defense Project, "JL-2 (Ju Lang-2/CSS-NX-14)," Missile Threat, Center for Strategic and International Studies, August 12, 2016, last modified October 7, 2019, https://missilethreat.csis.org/missile/jl-2/.
[90] Kristensen and Korda, "Chinese Nuclear Forces, 2019," 175.
[91] Ibid.

white papers at the time, this is one of the earliest examples of Beijing's pursuit of weapons systems specifically designed to penetrate missile defenses.[92] The DF-41 remains in a developmental stage to this day, though it is estimated it will be deployed soon.[93]

Writing in 2011, Hans M. Kristensen and Robert S. Norris wrote, "If the US ballistic missile defense system is expanded or improved, it could potentially trigger China to deploy missiles that have MIRVs and/or decoys."[94] Kristensen and Norris appear to have been correct in their assessment, as the American intelligence community estimates that many of the advanced Chinese nuclear weapons systems being fielded today had their developmental origins around the time the United States pulled out of the ABM Treaty.[95] According to China's published 2006 military strategy, China "endeavors to ensure the security and reliability of its nuclear weapons and maintains a credible nuclear deterrent force."[96] While not explicitly stated in this official policy document, under this logic the pursuit of diversified and upgraded nuclear weapons delivery systems and physical dispersion and hardening of existing nuclear

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[92] China's National Defense in 2006, accessed May 19, 2020, http://en.people.cn/whitepaper/defense2006/defense2006(2).html)
[93] "DF-41 (Dong Feng-41 / CSS-X-20)," Missile Threat, accessed May 19, 2020, https://missilethreat.csis.org/missile/df-41)
[94] Ibid.
[95] Zhang, Ming. "What threat?" *Bulletin of the Atomic Scientists*, vol. 55, no. 5, 1999, p. 52. *Gale Academic OneFile*, https://link-gale-com.libproxy.uoregon.edu/apps/doc/A55881820/AONE?u=s8492775&sid=AONE&xid=2b74c72d. Accessed 8 Apr. 2020
[96] China's National Defense in 2006, accessed May 19, 2020, http://en.people.cn/whitepaper/defense2006/defense2006(2).html)

assets seems rational. Later policy documents will explicitly cite the need for the People's Liberation Army (PLA) to counter missile defenses.[97]

2010-2020: A New Era of Great Power Competition

The PLA Rocket Force has been taking steps to diversify its ICBM arsenal with weapons systems capable of overwhelming missile defense systems. These new weapons make extensive use of decoys and MIRV (Multiple Independent Reentry Vehicle) systems according to a 2015 Senate Committee on Armed Services report.[98] The Pentagon's 2019 Annual Report to Congress on Military and Security Developments Involving the People's Republic of China states that China's nuclear diversification is by China's own admission:

> "*intended to ensure the viability of [China's] strategic nuclear forces in the face of continued advances in U.S. and, to a lesser extent, Russian strategic ISR [intelligence, surveillance, and reconnaissance], precision strike, and missile defense capabilities."*[99]

Essentially, China is being forced to update its nuclear strike capabilities due to the evolving international threat environment. According to estimates from the CIA dating

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[97] China's Military Strategy 2015 (full text), accessed May 19, 2020, http://english.www.gov.cn/archive/white_paper/2015/05/27/content_281475115610833.htm)

[98] "STATEMENT OF ADMIRAL C. D. HANEY COMMANDER UNITED STATES STRATEGIC COMMAND BEFORE THE SENATE COMMITTEE ON ARMED SERVICES 19 MARCH 2015." United States Senate Committee on Armed Services, March 19, 2015. https://www.armed-services.senate.gov/imo/media/doc/Haney_03-19-15.pdf.

[99] "ANNUAL REPORT TO CONGRESS: Military and Security Developments Involving the People's Republic of China 2019." Department of Defense. Department of Defense, May 2, 2019. https://media.defense.gov/2019/May/02/2002127082/-1/-1/1/2019_CHINA_MILITARY_POWER_REPORT.pdf.

from 1999, the PLA has had the capability to develop MIRV weapons systems for decades, but the cost associated with developing such systems and the PRC's fundamental goals and commitment to a "no first use" nuclear doctrine has historically made pursuing MIRV capabilities unattractive.[100]

China Reiterates Reserved Nuclear Doctrine

Chinese military planners for a long time did not emphasize the development of a nuclear triad (land, air, and sea delivery capabilities), but have rather focused on deploying low-alert long-range intercontinental ballistic missiles (ICMBs), intermediate-range ballistic missiles (IRBMs), and a small number of nuclear-powered ballistic missile submarines (SSBNs) with submarine-launched ballistic missile (SLBM) capabilities. Rather than arms racing with other nations China has historically sought to keep "the nuclear force at the minimal level required by national security" and "has not and will never engage in nuclear arms race" according to an official statement delivered at the 16th Beijing Seminar on International Security in 2016.[101] However, in its most recent analysis, the Pentagon reports that China is in the process of testing new nuclear weapons systems ranging from land-based MIRV-equipped missiles to hypersonic weapons.[102] This is breaking with decades of China's relatively conservative nuclear doctrine in an effort to diversify the Chinese nuclear arsenal to ensure its survivability

[100] "National Intelligence Council." Federation of American Scientists – Science for a safer, more informed world. Accessed April 28, 2020. https://fas.org/irp/threat/missile/nie99msl.htm.
[101] Maintaining Global Strategic Stability, Reducing Risks of Nuclear Conflicts. Accessed May 13, 2020. https://www.fmprc.gov.cn/mfa_eng/wjbxw/t1708326.shtml.
[102] "ANNUAL REPORT TO CONGRESS: Military and Security Developments Involving the People's Republic of China 2019." Department of Defense. Department of Defense, May 2, 2019.

and ability to launch a retaliatory second strike, effectively ensuring a credible deterrence doctrine.

China's land-based arsenal has historically relied on a "low alert" strategy. The military arm responsible for China's ICBMs (known as the Second Artillery Corps until 2006 when officially renamed the PLA Rocket Force), has historically stored nuclear warheads separately from their delivery systems.[103] This strategy allows the PLA Rocket Force to launch a retaliatory strike in as little as 10 minutes of a hostile strike on Chinese soil, while drastically reducing the possibility of an accidental or unauthorized launch.[104] As threats have evolved the PLA Rocket Force has updated its weapons systems with the addition of road-mobile solid-fueled rocket systems like the DF-31 in 2006.[105] These systems utilize their geographic mobility to increase their survivability, and can be launched more quickly as they do not need to be fueled prior to launch.[106] However, with advances in American targeting and battlefield monitoring technology, Chinese military leaders may not be able to rely on road mobile systems alone. Through recent conflicts in the Middle East, the United States has repeatedly demonstrated its military ability to strike mobile targets with precision accuracy from long ranges.[107] This

[103] Liping Xia. "China's Nuclear Doctrine: Debates and Evolution." Carnegie Endowment for International Peace. Accessed May 14, 2020. https://carnegieendowment.org/2016/06/30/china-s-nuclear-doctrine-debates-and-evolution-pub-63967.
[104] Ibid.
[105] Hui Zhang. "China's Nuclear Weapons Modernization: Intentions, Drivers, and Trends." Presentation, July 15, 2012. (presented at Institute for Nuclear Materials Management 53rd Annual Meeting, Orlando). https://www.belfercenter.org/publication/chinas-nuclear-weapons-modernization-intentions-drivers-and-trends
[106] Ibid.
[107] Eric Schmitt. "Improved U.S. Accuracy Claimed in Afghan Air War." The New York Times. The New York Times, April 9, 2002. https://www.nytimes.com/2002/04/09/world/a-nation-challenged-the-

capability could negate the survivability road-mobile launchers have enjoyed in the past.

Beijing Projects Power in the South China Sea

To give shorter range Chinese weapons a better platform to defend Chinese interests and assist in area-denial and anti-ship operations, the PLARF has placed surface-to-air missiles (SAMs) on the contested Spratly Islands in the South China Sea. Chinese President Xi Jinping claimed in 2015 that, "China does not intend to pursue militarization" on the Spratly Islands.[108] The United States has repeatedly cited the militarization of the South China Sea as evidence of untrustworthy Chinese aggression.[109]

The 2018 Nuclear Posture Review Asserts Great Power Competition

The American Department of Defense 2018 Nuclear Posture Review (NPR) clearly outlines the international security environment from the American perspective by asserting: "Since 2010 we have seen the return of Great Power competition."[110] Additionally, the 2018 NPR also claims, "The United States does not wish to regard either Russia or China as an adversary and seeks stable relations with both."[111]

The 2018 NPR represents the guiding philosophy behind contemporary American strategic nuclear doctrine and outlays the contemporary global environment

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bombing-improved-us-accuracy-claimed-in-afghan-air-war.html.
[108] ANNUAL REPORT TO CONGRESS: Military and Security Developments Involving the People's Republic of China 2019." Department of Defense. Department of Defense, May 2, 2019.
[109] Ibid.
[110] United States. 2018. *Nuclear Posture Review report*. Washington, DC: U.S. Dept. of Defense. Pg 7.
[111] Ibid.

from an American perspective.[112] The report asserts China's recent military technology programs have been "increasingly aggressive."[113]

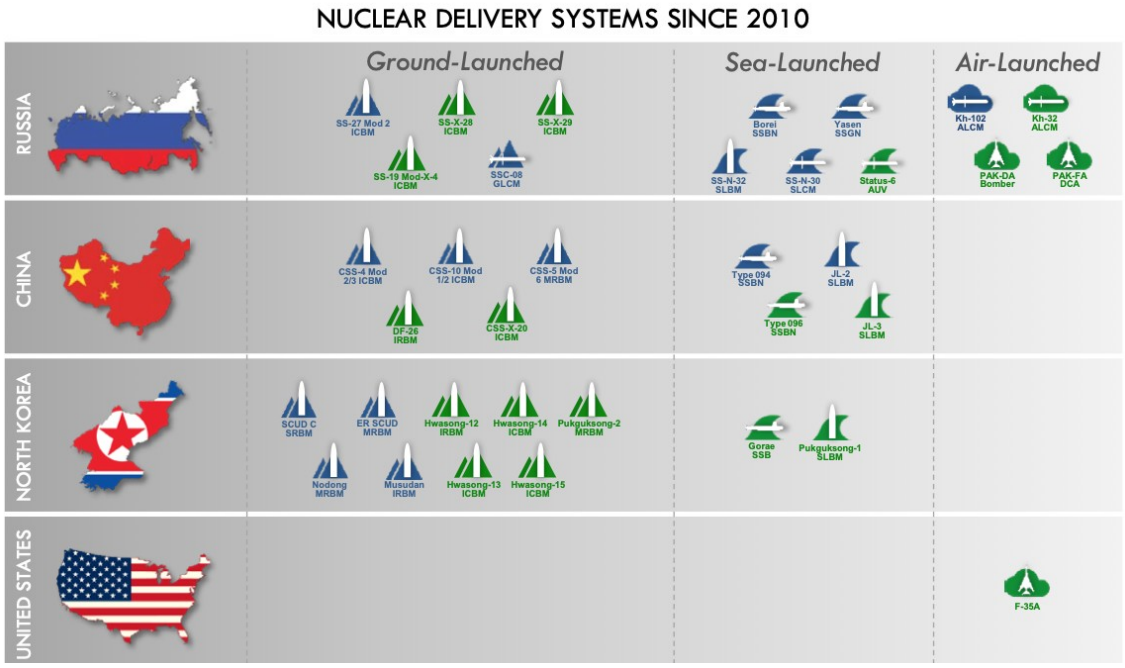

Figure 5: Nuclear Delivery Systems Fielded since 2010.[114]

The NPR uses the above chart to assert the aggressive actions of Russia, China, and North Korea to deploy new weapons systems. The report fails to mention that the United States already possessed many of the capabilities that these new weapons systems offer prior to the selected time period.

The emergence of China not only as a regional power but a nation capable of projecting influence far beyond its borders has characterized the past decade.[115] The Chinese military has been rapidly modernizing in this time through increased spending

[112] Ibid.
[113] United States. 2018. *Nuclear Posture Review report*. Washington, DC: U.S. Dept. of Defense. Pg 1.
[114] United States. 2018. *Nuclear Posture Review report*. Washington, DC: U.S. Dept. of Defense. Pg 8.
[115] United States. 2018. *Nuclear Posture Review report*. Washington, DC: U.S. Dept. of Defense. Pg 6.

on research and development of new home-grown weapons systems.[116] The PLA has initiated modernization acquisition programs for new weapons systems ranging from a massive shipbuilding program with the development of nuclear missile submarines to increases in both the variety and sheer number of missile platforms—both nuclear and conventional.

Though numbers of Chinese ICBMs are growing by all estimates, the rate of growth and the number of nuclear weapons in the Chinese arsenal has repeatedly been overestimated by various agencies within the American intelligence community, as demonstrated in the following figure.

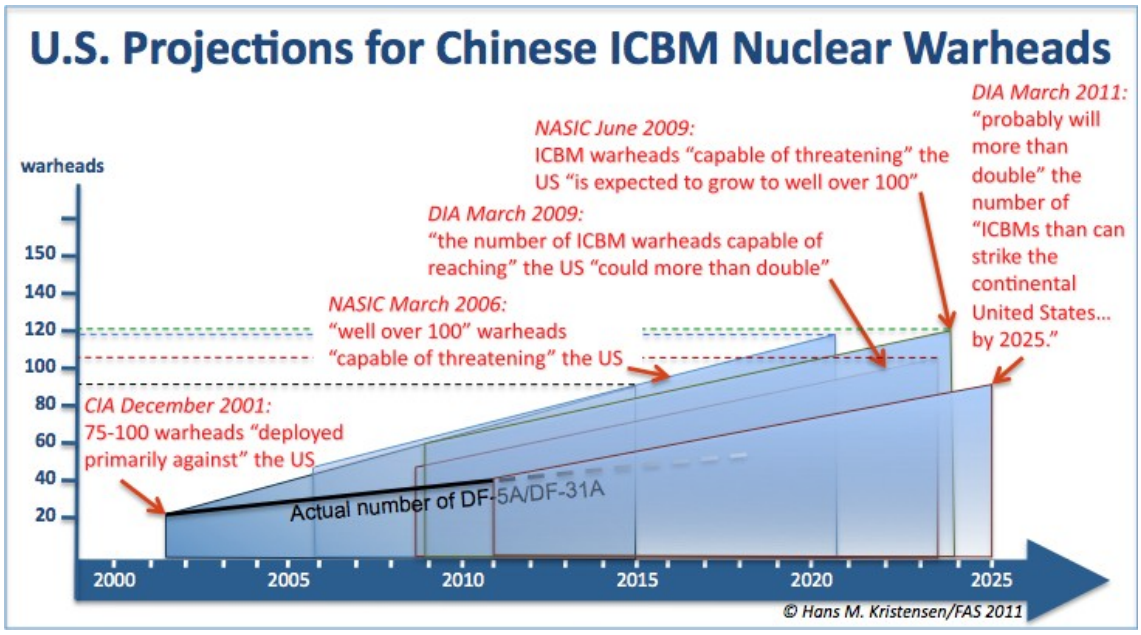

Figure 6: U.S. Projections for Chinese Nuclear Warheads Repeatedly Overestimate Actual Deployed Numbers[117]

The above figure represents the best estimates of numbers of Chinese nuclear warheads capable of reaching the United States through the year 2025. The data show that Beijing

[116] Ibid.

[117] Hans M. Kristensen, "No, China Does Not Have 3,000 Nuclear Weapons," Federation Of American Scientists, December 3, 2011, https://fas.org/blogs/security/2011/12/chinanukes/)

is for the most part adhering to its strategy of maintaining its nuclear force at "the minimum level required for maintaining its national security."[118] By China's own admission, the minimum amount of warheads required for deterrence increases when an adversary is fielding a ballistic missile defense system.

The United States Leaves the INF Treaty

The Intermediate-Range Nuclear Forces (INF) Treaty was signed by the Soviet Union and the United States in 1987 with the objective of eliminating missiles with ranges from 500-5,500 kilometers.[119] The United States withdrew from the treaty in 2019 due in part to Chinese possession of ballistic missiles within the INF range.[120] Secretary of Defense Mark Esper stated in 2018 that the United States will begin deployment of intermediate range ballistic missiles in the Pacific as soon as possible.[121] This will likely take some time as the United States does not have any intermediate range ballistic missiles in its arsenal due to the defunct INF Treaty's provisions. The proposed missiles would have to based on allied soil close to Chinese shores to place opposing Chinese missile batteries in range, though like the situation in Europe that led to the INF Treaty during the Cold War, American allies seem reluctant to host Washington's missiles.[122]

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[118] China's Military Strategy 2015 (full text), accessed May 19, 2020, http://english.www.gov.cn/archive/white_paper/2015/05/27/content_281475115610833.htm)
[119] "Fact Sheets & Briefs," The Intermediate-Range Nuclear Forces (INF) Treaty at a Glance | Arms Control Association, accessed May 19, 2020, https://www.armscontrol.org/factsheets/INFtreaty)
[120] Andrey Baklitskiy, "What the End of the INF Treaty Means for China," Carnegie Moscow Center, accessed May 19, 2020, https://carnegie.ru/commentary/80462)
[121] Ibid.
[122] Ibid.

Specific Weapons Systems

Chinese MIRVs

The PLARF has been updating legacy ICBMs (DF-5 type missiles) to be capable of carrying Multiple Independent Reentry Vehicles or MIRVs and is developing new missiles from the ground up such as the DF-41 that are designed specifically to have MIRV and hypersonic capabilities.[123] These are designed chiefly to overwhelm the missile defense systems of a potential adversary, namely the United States, as America is the only country to have seriously invested in national missile defense technology in recent years. Additionally, China has been developing long-range solid-fueled road-mobile delivery systems (such as the DF-31 and DF-41 ICBMs) capable of launching with limited warning as a response to demonstrated American conventional and nuclear strike capabilities that could nullify the traditional Chinese nuclear strategy of static hardened missile silos with low alert DF-5 ICBMs.[124]

The Legacy Missile: The DF-5 ICBM Becomes MIRV-Capable

As the United States has publicly committed to developing missile defense systems in recent years, China has begun employing MIRV systems on existing weapons delivery vehicles such as the DF-5. The DF-5 is a liquid-fueled ICBM capable of reaching the continental United States. The weapon has been commissioned in the

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[123] Missile Defense Project, "DF-41 (Dong Feng-41 / CSS-X-20)," *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified October 8, 2019, https://missilethreat.csis.org/missile/df-41/.

[124] "How Is China Modernizing Its Nuclear Forces?" ChinaPower Project, December 18, 2019. https://chinapower.csis.org/china-nuclear-weapons/.

PLARF's arsenal and in operational service with a single nuclear warhead since 1981.[125] The DF-5 modernization offered the PLARF the quickest route to a MIRV-enabled ICBM, as the existing rocket already possessed adequate lifting capacity and range to carry additional miniaturized warheads. In 2015 the PLARF claimed to have deployed the first MIRVed DF-5B in what could be interpreted as a direct response to heightened American rhetoric and technological advances in missile defense technology.[126]

China's DF-5 arsenal is widely geographically distributed and used to have only one warhead on each delivery system.[127] Because of the devastating nature of a single warhead, in the absence of a missile defense system Chinese leaders could be confident in their deterrent if even a single warhead could land on a foe's soil. The pre-launch survivability of the system was based primarily on the hardened nature of silos and the road-mobility of solid-fueled weapons systems. As American missile defense technology continues to develop, regardless of its effectiveness, China is hedging its nuclear retaliatory credibility across multiple systems to ensure it can defeat both missile defense and a potential American first strike aimed at wiping out the Chinese deterrent prior to launch.

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[125] "China Nuclear Forces Guide Chinese Nuclear Forces, 2019 by Hans M. Kristensen, Matt Korda, June 30, 2019 DIA Estimates For Chinese Nuclear Warheads by Hans M. Kristensen, FAS Security Blog, May 31, 2019." China Nuclear Forces. Accessed April 28, 2020. https://fas.org/nuke/guide/china.

[126] "Striving For A Safer World Since 1945." Federation of American Scientists. Accessed April 28, 2020. https://fas.org/irp/threat/missile/bm-2017.

[127] https://missiledefenseadvocacy.org/missile-threat-and-proliferation/missile-proliferation/china/dong-feng-5-df-5/

SLBMs: Increasing the Survivability of the Chinese Deterrent

In light of the wartime demonstrations of the accuracy of conventional long-range American strike weapons such as the Tomahawk cruise missile and others, the Chinese government has been forced reevaluate its existing deterrence strategy. Chinese leaders began to view their existing land-based ICBM deterrent as vulnerable to a potential American attack and sought to diversify their deterrent, not out of aggression, but to maintain its second-strike retaliatory capability.

With these new objectives in mind, the People's Liberation Army Navy (PLAN) sought to construct an inaugural class of home-grown Chinese SSBNs (nuclear-powered ballistic missile submarines). The first vessels to represent a "credible at-sea second-strike nuclear capability" according to the US Office of Naval Intelligence, are the Jin-class of which 4 are currently operational.[128] The weapon deployed on each of the Jin-class vessels is the JL-2 SLBM (submarine-launched ballistic missile). Each warship is outfitted with 12 such weapons, and each missile is allegedly capable of carrying up to 3 warheads.[129]

The warships of the current Jin-class and future SSBNs under development serve the primary purpose of providing the Chinese government a nuclear deterrent that remains credible in the face of rapid and demonstrated accuracy advances in both American conventional and nuclear power. Similar to Russia's strategy of maintaining a

[128] "The PLA Navy: New Capabilities and Missions for the 21st Century." Office of Naval Intelligence. Office of Naval Intelligence, 2015. Pg. 16. https://www.oni.navy.mil/Portals/12/Intel agencies/China_Media/2015_PLA_NAVY_PUB_Interactive.pdf?ver=2015-12-02-081058-483.

[129] "Does China Have an Effective Sea-Based Nuclear Deterrent?" ChinaPower Project, March 19, 2020. https://chinapower.csis.org/ssbn

powerful nuclear deterrent in the post-Soviet era, the Chinese government is increasingly focusing its military resources on nuclear deterrence where conventional forces cannot match the capabilities of the United States' military budget and resources.

Hypersonic Weapons

At its 70th anniversary parade in October 2019, the People's Liberation Army unveiled to the world the new HF-ZF hypersonic glide vehicle (HGV), mounted to a DF-17 medium range ballistic missile (MRBM).[130] While the new weapons system received considerable media attention worldwide, many analysts claim the DF-17 "does not dramatically strengthen the conventional threat that China poses to U.S. or allied forces in the region."[131] However, even though the HF-ZF is currently only fielded on an MRBM with a conventional warhead, the HGV could be adapted to carry a nuclear warhead and could theoretically be mounted on the DF-31 ICBM in the future. However, for the time being, the main threat posed by hypersonic weapons is the ability of the HGV to evade missile defense systems and target American naval assets and land bases in Japan and South Korea.[132]

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130 "Arms Control Today," China Shows Off New Missiles | Arms Control Association, accessed May 19, 2020, https://www.armscontrol.org/act/2019-11/news/china-shows-new-missiles)

131 Ibid.

132 "DF-ZF Hypersonic Glide Vehicle," Missile Defense Advocacy Alliance, accessed May 19, 2020, https://missiledefenseadvocacy.org/missile-threat-and-proliferation/missile-proliferation/china/df-zf-hypersonic-glide-vehicle/)

Threat Hype Analysis

This section will detail a selection of the most significant sources of hype in the American government, press and public about the alleged threats posed to the United States by recent Chinese military actions. The key areas of focus will be on the strategic implications of Chinese hypersonic and MIRV-capable weapons, the shortcomings of the argument in favor of American national missile defense systems, a potential Taiwan crisis, and the land reclamation and militarization projects in the South China Sea.

Strategic Implications of Chinese Hypersonic Weapons

Hypersonic weapons have the potential to escalate potential conflicts between the United States and China in the Pacific.[133] Because of the difficulty associated with detecting and predicting the ultimate target of a hypersonic weapon, little time is available for the subject of the strike to consider their options. The DF-21 medium range ballistic missile (MRBM) is particularly dangerous in the event of even a limited Sino-American conflict in the Pacific. The missile is currently fielded with multiple variants, and while initially all were nuclear armed, some (DF-21C/D) have been outfitted with conventional and anti-ship missiles.[134] According to Kristensen,

> "The mix of nuclear and conventional DF-21s is potentially disastrous: If China were to ready conventional DF-21Cs for launch in a conflict, it could create the risk of misunderstanding, miscalculation, and

[133] Eleni Ekmektsioglou. "Hypersonic weapons and escalation control in East Asia." *Strategic Studies Quarterly*, vol. 9, no. 2, 2015, p. 43+. *Gale Academic OneFile*, https://link-gale-com.libproxy.uoregon.edu/apps/doc/A421771129/AONE?u=s8492775&sid=AONE&xid=56e1a097. Accessed 9 Apr. 2020.
[134] Kristnesen, Hans M., and Robert S. Norris. "Chinese Nuclear Forces, 2011." Bulletin of the Atomic Scientists, 2011. https://journals.sagepub.com/doi/pdf/10.1177/0096340211426630.

> the potential for escalation if its adversary mistook the conventional DF-21s for their nuclear counterparts."[135]

The ambiguity of the arms mounted on the DF-21 could provide the impetus for crisis to spiral into nuclear war if the United States mistook an incoming conventionally armed Chinese warhead as nuclear and launched on warning.[136]

Hypersonic weapons—even when equipped with relatively small conventional warheads—could make the theoretical possibility of a nation to mount a "decapitating" strike on an adversary more likely. With the ability to strike anywhere in the world in a matter of minutes, accurate hypersonic weapons could theoretically be employed to target another nation's leaders and military chain of command. This puts pressures on nations that may be threatened by hypersonic attack to put in place measures to decentralize their nuclear command and control capabilities. By devolving command and control away from the central civilian and military leaders of a nation's government, more possibilities for miscalculated or mistaken strikes could occur.

While at first glance hypersonic weapons seem to offer nations unprecedented options for regime change and international warfighting capabilities, the overall strategic picture remains relatively unchanged. Nuclear deterrence will still serve to dissuade nuclear powers from all-out conflicts with each other, and while hypersonic weapons and by extent MIRVs offer the ability to break through an adversary's missile defense systems, the fact remains that a relatively constrained nuclear arsenal of

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[135] Ibid.

[136] Eleni Ekmektsioglou. "Hypersonic weapons and escalation control in East Asia." Strategic Studies Quarterly, vol. 9, no. 2, 2015, p. 43+. Gale Academic OneFile, https://link-gale-com.libproxy.uoregon.edu/apps/doc/A421771129/AONE?u=s8492775&sid=AONE&xid=56e1a097. Accessed 13 May 2020.

hundreds of missiles is still capable of the same feat.[137] The following section will explore expert opinions on how Chinese hypersonic weapons and American national missile defense efforts significantly change (or don't change) the international strategic security environment.

Chinese Hypersonic Development: Regional

China is using area-denial hypersonic (particularly anti-ship) weapons to increase their security in the Western Pacific.[138] By denying the American military access to China's near coast, the PLA is using asymmetric warfare to strip the United States of its advantage in conventional long-range accurate weapons targeting. For example, ship-born Tomahawk cruise missiles have a proven strike range of over 900nm in combat during Operation Desert Storm in 1991.[139] These and other advanced American conventional weapons were perceived as such a significant threat to incumbent Chinese nuclear forces as to provide a portion of the justification for China's pursuit of area-denial weapons to secure the ocean off its shores. The mere existence of China's enhanced PLARF weapons has been enough to escalate tensions with the United States in the region. Before China's development of hypersonic and anti-ship

[137] Hans M Kristensen, Robert S Norris, and Ivan undefined Oelrich. "From Counterforce to Minimal Deterrence: A New Nuclear Policy on the Path Toward Eliminating Nuclear Weapons." Federation of American Scientists, April 2009. Page 2. https://fas.org/pubs/_docs/occasionalpaper7.pdf.
[138] Missile Defense Project, "DF-21 (Dong Feng-21 / CSS-5)," *Missile Threat*, Center for Strategic and International Studies, April 13, 2016, last modified January 2, 2020, https://missilethreat.csis.org/missile/df-21/.
[139] Dan Petty. "Navy.mil Home Page." The US Navy -- Fact File: Tomahawk Cruise Missile. Accessed May 14, 2020. https://www.navy.mil/navydata/fact_display.asp?cid=2200&tid=1300&ct=2.

missiles, the American Navy was able to conduct joint operations with regional allies in the international waters near the Chinese coast. Now, every American ship in the region is within range of Chinese warheads.[140]

China currently fields two rocket systems capable of carrying a hypersonic glide vehicle (HGV) payload, one regional and one intercontinental. The regional weapon is the DF-17 medium-range ballistic missile (MRBM), which will be capable of anti-ship missions off the Chinese coast (1000-1500 miles offshore) with an HGV warhead.[141] The DF-17 was designed from the ground up to carry HGV warheads, and is the first Chinese missile developed with hypersonic capabilities in mind.[142] The particular hypersonic glide vehicle mounted to the Df-17 rocket is the DF-ZF, which is capable of speeds up to Mach 10 and of performing "extreme maneuvers" to avoid interception.[143] This hypersonic weapons platform is provides China with a potent counter to deployed American military assets in the Pacific as it puts major American and allied bases in Japan, and South Korea in range of a Chinese missile attack with little to no warning. According to most analysists, the DF-17 with a DF-ZF HGV is currently not capable of

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[140] "Missiles of China." Missile Threat. Accessed April 28, 2020. https://missilethreat.csis.org/country/china/.
[141] Ankit Panda, "Introducing the DF-17: China's Newly Tested Ballistic Missile Armed with a Hypersonic Glide Vehicle," *The National Interest,* December 28, 2017, https://thediplomat.com/2017/12/introducing-the-df-17-chinas- newly-tested-ballistic-missile-armed-with-a-hypersonic-glide-vehicle/; and Bill Gertz, "China's new hypersonic missile," *Washington Times,* October 2, 2019, https://www.washingtontimes.com/news/2019/oct/2/china-shows-df-17- hypersonic-missile/.
[142] Ibid.
[143] Ibid.

mounting a nuclear warhead, but nuclear capability remains a possible upgrade for the system in the future.

The primary regional concern for the United States and other powers operating in the western Pacific is the threat posed to American and allied warships operating in the area.[144] Missile defense systems like Lockheed Martin's advanced Aegis missile defense platform deployed on American and Japanese warships have not demonstrated the ability to intercept hypersonic missiles and could thus be acutely vulnerable to the DF-ZF HGV.[145] While these developments could provide challenges to American naval operations in littoral areas near the China coast (particularly concerning Taiwan) these weapons do not represent a vital national security concern to the continental United States due to their areas of deployment primarily on the Chinese coast and effective ranges.

[144] Bradley Perrett, Bill Sweetman, Michael Fabey, "U.S. Navy Sees Chinese HGV As Part Of Wider Threat," Aviation Week, January 27, 2014, https://aviationweek.com/defense-space/us-navy-sees-chinese-hgv-part-wider-threat; Franz-Stefan Gady, "China Tests New Weapon System," The Diplomat.

[145] Oelrich, OelrichIvan, and Elliott School. "Cool Your Jets: Some Perspective on the Hyping of Hypersonic Weapons." Taylor & Francis. Accessed May 14, 2020. https://www.tandfonline.com/doi/abs/10.1080/00963402.2019.1701283?journalCode=rbul20.

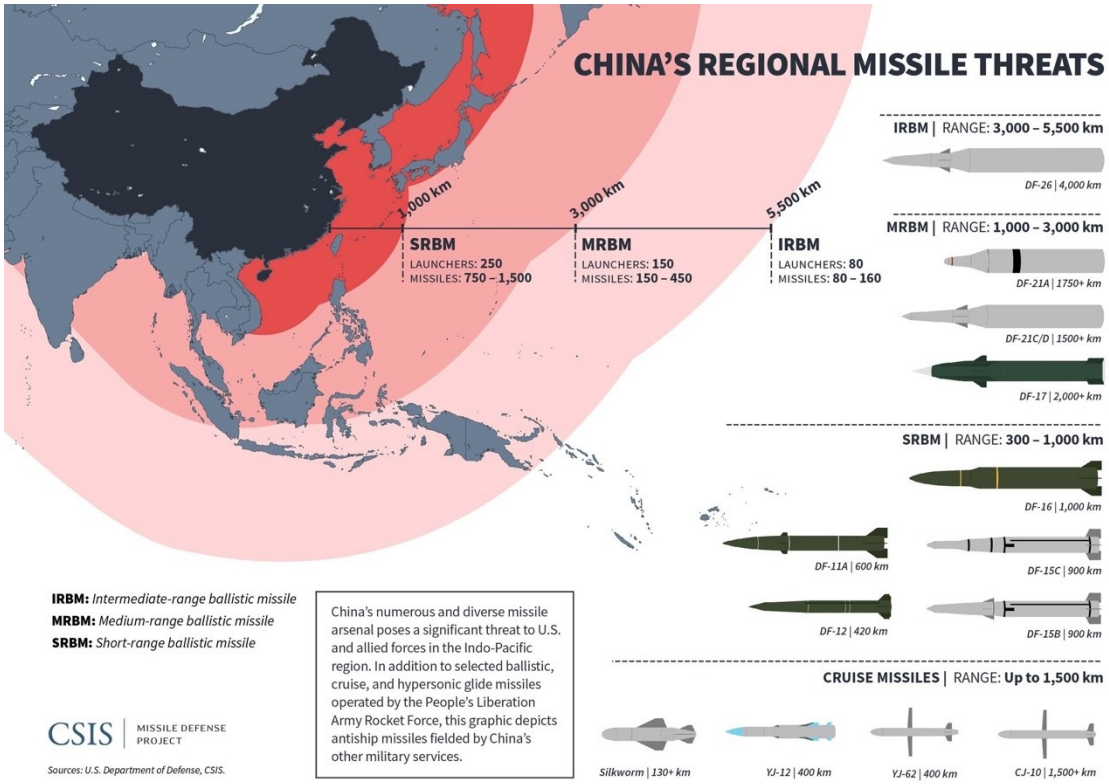

Figure 7: Ranges of Chinese Regional Missiles [146]

Chinese Hypersonic Development: Intercontinental

While the DF-17 and DF-ZF HGV represent regional hypersonic capabilities, the road-mobile solid-fueled DF-41 ICBM paired with a hypersonic (or MIRV) warhead delivery system represents a more pressing threat to the United States. Due to the nature of ICBM flight trajectories, all of the DF-41 MIRVs will travel at hypersonic speeds on reentry.[147] Defense analysts estimate the DF-41 when deployed will have a range capable of striking anywhere within the continental United States in 30 minutes

[146] "Missiles of China." Missile Threat. Accessed May 14, 2020. https://missilethreat.csis.org/country/china/.
[147] "More Than Missiles: China Previews Its New Way of War," More Than Missiles: China Previews its New Way of War | Center for Strategic and International Studies, May 13, 2020, https://www.csis.org/analysis/more-missiles-china-previews-its-new-way-war)

or less.[148] Information on the origins and rationale for the development of the DF-41 is murky. The earliest academic reports of the missile in development appeared in the year 1999 with reports claiming the missile was part of the Chinese government's aim to replace the incumbent DF-5, which had been in service since the early 1980s.[149] The purpose of the DF-41's development is reduce the Chinese nuclear deterrent's vulnerability to a decapitating first strike and to break through missile defense systems. The new ICBMs are designed to be launched much faster than the liquid-fueled silo-based DF-5 due to their solid-fueled design and can be readied to fire in minutes.[150]

Perhaps more pressing that the DF-41's alleged hypersonic capabilities are the rumors that the new missile can likely be outfitted with a rumored 10 warheads on MIRVs. The Federation of American Scientists suggests that this number is likely too high and predicts the DF-41 will likely be outfitted with a maximum of three MIRV warheads.[151]

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[148] Missile Defense Project, "DF-41 (Dong Feng-41 / CSS-X-20)," *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified October 8, 2019, https://missilethreat.csis.org/missile/df-41/.

[149] Zhang, Ming. "What threat?" *Bulletin of the Atomic Scientists*, vol. 55, no. 5, 1999, p. 52. *Gale Academic OneFile*, https://link-gale-com.libproxy.uoregon.edu/apps/doc/A55881820/AONE?u=s8492775&sid=AONE&xid=2b74c72d. Accessed 8 Apr. 2020

[150] Missile Defense Project, "DF-41 (Dong Feng-41 / CSS-X-20)," *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified October 8, 2019, https://missilethreat.csis.org/missile/df-41/.

[151] Kristensen, Hans M. "Military Might Takes Center Stage at Chinese 70-Year Anniversary Parade." Federation Of American Scientists, October 1, 2019. https://fas.org/blogs/security/2019/10/china-military-parade/.

Strategic Implications of Chinese MIRVs

MIRVs and Missile Defense: Cold War Lessons Unlearned

The United States was the first nation to develop nuclear missiles with Multiple Independently targetable Reentry Vehicle (MIRV) technology during the height of the Cold War. These warheads were first deployed on the Minuteman III ICBM system in 1970, and the following year on the Poseidon SLBM (Submarine Launched Ballistic Missile).[152] MIRV technology was not initially developed or deployed to defeat missile defense. Instead, researchers in the Department of Defense cited a strategic concern regarding the number of single-warhead missiles in the American arsenal. According to Dr. John Foster, Director, Defense, Research and Engineering, US Dept. of Defense, "it was found that the total number of aim points exceeded the number of Minuteman missiles."[153] Therefore, MIRV technology was developed to meet offensive strategic objectives without dramatically increasing the number of ICBM missiles in the American arsenal, an objective stated by Secretary of Defense Robert McNamara, who saw a "fully credible offensive assured destruction capability" as the most important element of American national security.[154]

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[152] The Minuteman III ICBM, October 7, 1997. http://nuclearweaponarchive.org/Usa/Weapons/Mmiii.html.

[153] US Congress, Dept. of Defense Appropriations, Fiscal Year 1969, Senate Hearings, Appropriations Committee, 90th Congress, 1968, Part 4, page 2310, US GPO, Washington, D.C.

[154] "'Mutual Deterrence' Speech by Sec. of Defense Robert McNamara." "Mutual Deterrence" Speech by Sec. of Defense Robert McNamara | Arms Control, Deterrence and Nuclear Proliferation | Historical Documents. Accessed April 28, 2020. http://www.atomicarchive.com/Docs/Deterrence/Deterrence.shtml.

By the time MIRV systems were first deployed, it was discovered that the Soviet Union had developed and deployed an anti-ballistic missile system around Moscow called "Galosh."[155] While the United States did not develop MIRVs to defeat an ABM system, American defense planners and politicians came to the conclusion that the new technology could be used to mitigate the effectiveness of the Russian ABM system by overwhelming its targeting computers and interceptors with multiple warheads. Defense Secretary Melvin Laird was quoted in a 1969 congressional hearing where he claimed, "[MIRV] was not related to Galosh because we started appropriating funds for the development of this program prior to the time we knew Galosh was in being."[156]

In response to American MIRVs the Soviet Union fielded its own MIRVed ICBMs in 1975 and SLBMs in 1978.[157] These Soviet advances in MIRV technology had been predicted by McNamara a decade earlier, and had been one of the principle reasons the Secretary of Defense was opposed to the large scale deployment of American missile defense systems—arguing the long-term security of both countries would be hindered rather than helped by the massive expenditures caused by the advent of ABM systems and their relative ineffectiveness in the face of MIRVed missiles. McNamara argued, "Were we to deploy a heavy ABM system throughout the United States, the Soviets would clearly be strongly motivated to increase their offensive capability so as to cancel out our defensive advantage."[158] Although not their original

[155] "Case Study 3: The Origin of MIRV." Federation of Atomic Scientists. Accessed May 13, 2020. https://fas.org/man/eprint/leitenberg/mirv.pdf.
[156] Ibid.
[157] Ibid.
[158] "The ABM Puzzle: An Introduction to Politics inside Government." Brookings. Brookings Institute, July 2016. https://www.brookings.edu/wp-content/uploads/2016/07/bureaucratic

intent, MIRV technology provided an effective countermeasure to overcome any potential defensive strategy that relied on missile defense.

Chinese MIRVs Today

It should come as no surprise that the China is fielding MIRV-capable ICBMs today. The United States went down this road with the Soviet Union during the Cold War, which culminated in the signing of the ABM Treaty when both sides realized the resulting arms race was counterproductive to their own respective national security. Though China's MIRVs are specifically being deployed to counter ABM advances by the United States, some still argue that China is aiming to develop an offensive capability.[159] When looking at the overall picture of Chinese modernization, this is simply not true.

An offensive nuclear capability requires a counterforce doctrine where an aggressor can target and destroy most—if not all—of another's nuclear weapons in a disarming first strike.[160] China does not possess nearly enough weapons to have the capability to carry out a counterforce strike on American deterrent forces. High end estimates of the Chinese arsenal place the number of Chinese warheads capable of targeting the United States at roughly 90.[161] Given that the United States fields over

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politicsforeignpolicy_chapter.pdf.

[159] Elbridge Colby. "If You Want Peace, Prepare for Nuclear War." Foreign Affairs, January 28, 2019. https://www.foreignaffairs.com/articles/china/2018-10-15/if-you-want-peace-prepare-nuclear-war.

[160] Keir A Lieber and Daryl G Press, "The New Era of Counterforce," International Security (Massachusetts Institute of Technology, 2017), oi:10.1162/ISEC_a_00273)

[161] ANNUAL REPORT TO CONGRESS: Military and Security Developments Involving the People's Republic of China 2019." Department of Defense. Department of Defense, May 2, 2019

1,500 deployed nuclear weapons dispersed geographically and across its various nuclear triad systems, to assert that China could be pursuing a first strike capability would be extremely misleading.[162] Overall Chinese arsenal growth has proven slow, existing capabilities are being augmented to ensure Beijing's deterrent is capable of penetrating the American national missile defense system deployed in Alaska and California as well as any future upgrades the system may see.

China currently does not possess enough fissile material for a significant nuclear arms build-up.[163] A similar effect to MIRV systems could be achieved through inexpensive decoy or chaff systems. In the midcourse phase of an ICBM's launch process (the phase in which the current American missile defense system aims to intercept incoming ICBMs) decoy warheads of different weights are impossible for the system to distinguish from the real warhead. This is because the flight path of both decoys and real warheads would be identical in space (regardless of their different weights) due to the absence of atmospheric drag. There is disagreement among some scholars about whether the PLARF has actually developed MIRV capability for the DF-5B, or whether the updated missile is actually equipped with decoys—a far more cost-effective option. Regardless of whether the missile is equipped with MIRV or decoys, the effect the weapon will have on overwhelming a missile defense battery is the same. Historically, the existence of this relatively inexpensive workaround has left proponents

[162] "Fact Sheets & Briefs," Nuclear Weapons: Who Has What at a Glance | Arms Control Association, accessed May 19, 2020, https://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat)

[163] "Why China Stopped Making Fissile Material for Nukes," Bulletin of the Atomic Scientists, May 1, 2020, https://thebulletin.org/2018/03/why-china-stopped-making-fissile-material-for-nukes/)

and developers of missile defense systems with an unsolvable problem that dates back to the very beginnings of American missile defense efforts.

Chinese development and deployment of MIRVs is not evidence of an offensive buildup, which would take decades and require enormous sums to even reach parity with the United States (much less achieve the superior numbers required for a counterforce strategy). Instead Beijing is adapting its arsenal as the requirements for a minimum deterrent have changed.

American Missile Defense Systems

In the aftermath of the American withdrawal from the ABM Treaty the Bush administration tasked the Missile Defense Agency (MDA) with fielding a national missile defense as soon as possible.[164] The MDA produced and fielded a limited number of Ground-based Midcourse Defense (GMD) interceptors in Alaska and California in 2004.[165] Like SDI before it, the MDA and its GMD system have spent billions with relatively little progress made towards a robust national missile defense. Today, the MDA lists a total of 44 GMD interceptors fielded, with a success rate of only about 52% even under unrealistic idealized testing scenarios.[166] Many of the tests that have taken place have been under scripted scenarios where the system was fed data on the exact flight path of the "enemy" ICBM beforehand. In some cases, the target warhead

[164] George Lewis, and Frank von Hippel. "Limitations on Ballistic Missile Defense, Past and Possibly Future." Bulletin of the Atomic Scientists. Bulletin of the Atomic Scientists, June 28, 2018. https://doi.org/10.1080/00963402.2018.1486575.
[165] Ibid.
[166] "GMD: Frequently Asked Questions." Center for Arms Control and Non-Proliferation. Accessed May 14, 2020. https://armscontrolcenter.org/issues/missile-defense/gmd-frequently-asked-questions/.

even was equipped with a homing system to aid the interceptor in target acquisition among dummy decoy warheads.[167] The system has not demonstrated any significant improvements in recent testing either, as the following figure demonstrates.

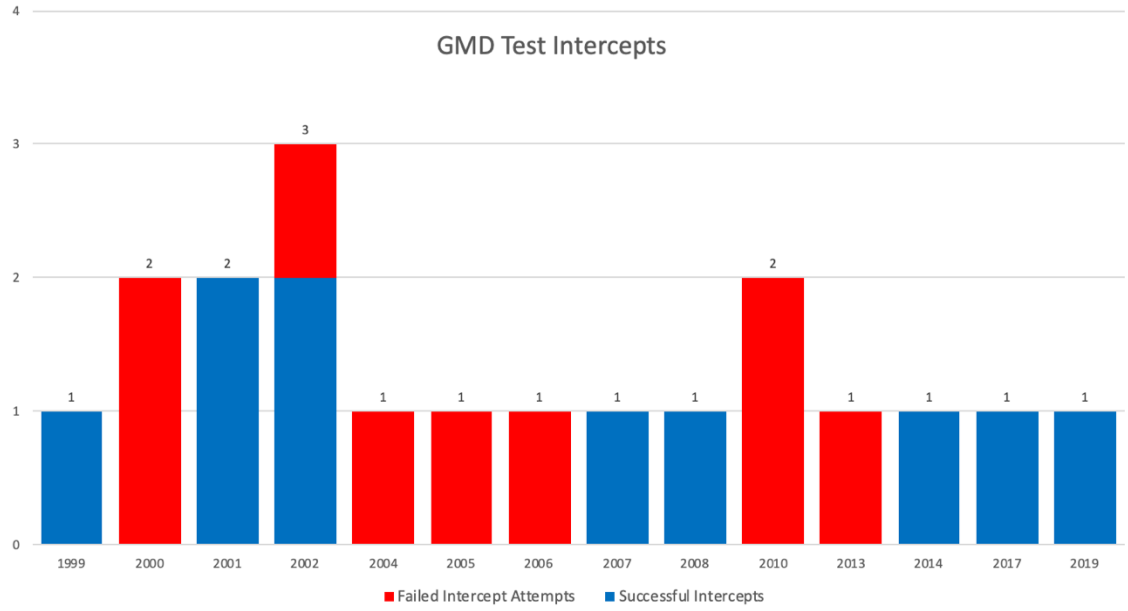

Figure 8: Ground-Based Midcourse Defense Intercept Tests

Given the GMD's doubtful effectiveness, the MDA is looking to augment its missile defense capabilities through adapting other systems from across the Department of Defense inventory. Perhaps the most notable national missile defense transplant is the technology borrowed from the US Navy's Aegis weapons system.

Aegis, developed by Lockheed Martin originally for deployment on US cruisers and destroyers, was initially intended for theater missile defense of military assets. With the development of the new standard missile (SM-3 Block IIA) by Raytheon, American

[167] "Incremental Progress but No Realistic Capability," Union of Concerned Scientists, accessed May 19, 2020, https://www.ucsusa.org/resources/analysis-gmd-missile-defense-test-ftg-15)

warships and new Aegis ashore land-based platforms are working toward building the capability to shoot down some ICBMs.[168] The SM-3 has thus far proven more reliable than the GMD program with 34 success in 43 intercept tests as of October 2019.[169] It is, however, important to note that thus far SM-3 tests have not been conducted against ICBMs, but shorter range ballistic missiles.[170] The MDA plans to test the SM-3 Block IIA against a target ICBM during 2020.[171] Regardless of qualitative advantages of forward deployed SM-3 missiles, operating within range of Chinese MRBMs and SRBMs means that China will likely always enjoy the numerical advantage required to overwhelm the system, especially given the relatively low cost of ballistic missiles relative to interceptors.[172] This always lends China a defensive home-field advantage, but still does not prove any offensive intent.

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[168] Korda, Matt, and Hans M Kristensen. "US Ballistic Missile Defenses, 2019." Bulletin of the Atomic Scientists. Bulletin of the Atomic Scientists, October 24, 2019. https://doi.org/10.1080/00963402.2019.1680055.

[169] Ibid.

[170] Lendon, Brad. "US, Japan Conduct Successful Missile Intercept." CNN. Cable News Network, February 6, 2017. http://www.cnn.com/2017/02/05/politics/us-japan-aegis-missile-defense-test/index.html.l

[171] Korda, Matt, and Hans M Kristensen. "US Ballistic Missile Defenses, 2019." Bulletin of the Atomic Scientists. Bulletin of the Atomic Scientists, October 24, 2019. https://doi.org/10.1080/00963402.2019.1680055.

[172] Eugene Gholz, Benjamin Friedman & Enea Gjoza (2019) Defensive Defense:
A Better Way to Protect US Allies in Asia, The Washington Quarterly, 42:4, 179., DOI: 10.1080/0163660X.2019.1693103

Militarization of Contested Islands in the South China Sea

China has been building artificial islands in the South China Sea since 2014.[173] These islands serve to assert Chinese sovereignty over the resource rich surrounding waters, which are dispute by several other neighboring countries. The Philippines, Vietnam, Taiwan, Brunei and Malaysia all have disputes with China over this territory, and the United Nations Convention on the Law of the Sea ruled that Chinese claims were in violation of international maritime law in 2016.[174] None of these regional countries have the power to challenge Chinese territorial aspirations. While the United States does not endorse any specific claim to the islands, American warships are regularly sent on Freedom of Navigation Operations (FONOPS) to ensure international maritime laws are upheld.[175]

One of the principle American concerns with China's offshore military bases is that the Chinese could effectively choke one-third of the world's total sea trade.[176] This argument is inherently flawed as China is by far the largest trading economy operating in the South China Sea—it would be counterproductive for China to strangle its own trade in a potential crisis.[177] Given that only about 3% of all trade flowing through the

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[173] ABC News (ABC News Network), accessed May 19, 2020, https://abcnews.go.com/Politics/us-navy-sails-past-disputed-artificial-islands-claimed/story?id=60993256)
[174] Ibid.
[175] Hannah Beech, "China's Sea Control Is a Done Deal, 'Short of War With the U.S.'," The New York Times (The New York Times, September 20, 2018), https://www.nytimes.com/2018/09/20/world/asia/south-china-sea-navy.html)
[176] Ibid.
[177] "How Much Trade Transits the South China Sea?," ChinaPower Project, October 10, 2019, https://chinapower.csis.org/much-trade-transits-south-china-sea/)

South China Sea is destined for the United States, even if China were to stifle trade the impact would be much greater on the Chinese economy than the United States'.[178]

Given the high profile and posture of the United States to test overreaching territorial claims and China's unflinching claim over the disputed region it seems likely that neither is going to allow the other concessions in the South China Sea. The United States will continue FONOPs and the Chinese will hold their manmade ground. Demonstrating this assessment while speaking on FONOP flyover operations, American Commander Chris Purcell remarked,

> "What they want is for us to leave, and then they can say that we left because this is their sovereign territory. It's kind of their way to try to legitimize their claims, but we are clear that we are operating in international airspace and are not doing anything different from what we've done for decades."[179]

While not necessarily a harbinger of doom, the close operational proximity of American and Chinese military assets increases the risk of a crisis that could lead to a larger conflict. There have already been multiple incidents where Chinese warships had near misses with American vessels within miles of Chinese bases in the Spratly and Paracel Islands.[180]

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[178] Ibid.
[179] Hannah Beech, "China's Sea Control Is a Done Deal, 'Short of War With the U.S.'," The New York Times (The New York Times, September 20, 2018), https://www.nytimes.com/2018/09/20/world/asia/south-china-sea-navy.html)
[180] Geoff Ziezulewicz, "Video Shows near Collision of US and Chinese Warships," Navy Times (Navy Times, November 5, 2018), https://www.navytimes.com/news/your-navy/2018/11/05/video-shows-near-collision-of-us-and-chinese-warships/)

Perhaps the greatest reason for the hype of Chinese militarization in the South China Sea is that the installations themselves are physically visible. This is demonstrated in the following image.

Figure 9: Chinese Fortifications Under Construction at Subi Reef in the South China Sea

The airbases and missile silos are clearly visible from space and provide the most readily apparent example of Chinese armament. The islands can also be seen as an aggressive measure, potentially giving Chinese armed forces longer striking range for land-based missiles and placing yet more contested territory like Taiwan in easy reach of Chinese air forces. They are a key example of Chinese power projection beyond its borders, though it is worth noting that, as a regional hegemon, China would be expected to exercise claims over resources off its shores. The United States was likely never

interested in claiming resources rights in an area so far from its shores, so thus American interests are not as threatened as many claim they may be.

An Arms Race with China is Not Inevitable

"China is not an enemy."[181] In response to recent actions by the Trump administration, a significant group of influential American thinkers penned a letter to the White House and Congress calling for a change in American defense policy toward China. This paper reaches a similar conclusion. Budgetary analysis has proven that even though China is spending more now than ever before on defense, the gulf between the United States and Beijing remains significant. Additionally, when Chinese nuclear modernization was prioritized following the American withdrawal from the ABM Treaty, the advances in Chinese weapons systems have been primarily focused on countering American missile defense rather than producing an offensive advantage.

The United States would be well served to back away from any weapons development programs that could be interpreted as offensive posturing against China. Such programs could likely result in outcomes detrimental to both American and Chinese interests. Rather than building arms, Washington and Beijing should focus on building bridges. Just because China's influence is growing does not mean the United States' position as the world's preeminent military power is in jeopardy. Deterrence holds in the 21st century and the United States should not pursue a warfighting strategy against China.

While the United States may have to live with some concessions—namely the Chinese reclamation of land and the home-field advantage enjoyed by short and

[181] J. Stapleton Roy M. Taylor Fravel, "Opinion | China Is Not an Enemy," The Washington Post (WP Company, July 3, 2019), https://www.washingtonpost.com/opinions/making-china-a-us-enemy-is-counterproductive/2019/07/02/647d49d0-9bfa-11e9-b27f-ed2942f73d70_story.html)

medium range Chinese ballistic missiles—Washington can be content in the security of its nuclear arsenal and the strength of its worldwide network of alliances. As a great power, it may be reasonable for China to control a sphere of influence close to its shores. By giving China space to operate its SSBNs, Washington can assure Beijing's confidence in its own deterrent, dissuading further Chinese vertical nuclear proliferation.

Perhaps the biggest bargaining chip Washington has on the table is ballistic missile defense. If the United States could negotiate the cancellation or reduction of its own national missile defense it could likely achieve Chinese concessions. This could remove much of the rationale for each side's arms buildups and potentially lead to future arms control agreements.

The United States has built an international system based on promoting democratic ideals and freedom of trade throughout the world. Through this leadership Washington has been able to build strong alliances and foster more cooperation than conflict. The United States should not see China's economic and military growth as a challenger to stifle, but a new partner to accommodate. Through strengthening existing alliances, the United States can use geopolitical and economic incentives to foster cooperation with China in an international system where the United States still maintains the preeminent role. An arms race with China is not inevitable.

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